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Car Wheel Failures

The report of the Committee on Car Wheels brought out the fact that of 904 625-lb. M. C. B. wheels reported as cracked and broken in the plate, 63.6 per cent were under refrigerator cars. A great many wheels of this size are used under cars which have a gross weight of over 100,000 lb. and, as pointed out by the committee, the overloading, combined with the high braking force, is probably the cause of so many failures under these cars. While the overloading is not entirely to blame, it probably has a good share in causing the failures, and the recommendation of the committee that wheels of the proper size should be used under refrigerator car equipment by all railways and private car companies, should be acted on. The interests of safety demand the employment of wheels of the proper dimensions under all freight cars.

Specifications and Tests of Materials

In presenting the report of the Committee on Specifications and Tests of Materials at Tuesday's session, C. D. Young, the chairman, called attention to the fact that should these specifications be adopted as recommended practice their later advancement to standard practice would depend entirely on the information derived from their actual use by the members. The point raised cannot be emphasized too strongly. There is too often a laxity on the part of the individual members of the association in putting into practice the recommendations which are adopted by the association. This is not only discouraging to the committees making the recommendations, but tends to burden the recommended practices of the association with what is dead matter judged by its practical effect. The preparation of the report of this committee has entailed a large amount of detailed investigation in an endeavor to provide the association with complete specifications for practically all material used in car construction, and it is especially worthy of the support of the members. The effectiveness of the work of the association depends on the use made of its committee reports.

Car Department and Increased Earnings

In a paper presented before the Car Foreman's Association of Chicago in May, 1913, C. J. Wymer, general car foreman of the Chicago & Western Indiana, urged the members to do what they could to get the car department on an equal footing with other departments of no greater importance. We have before pointed out that much of the very efficient work which has been done in the car department has been in spite of the discouraging treatment received from railway officers, rather than because of their encouragement. The car department is not always looked upon in the right light; in the majority of cases it is considered rather a necessary evil, but do the higher officers realize that by giving the car department a fair show it can produce wonderful results, not only in the way of reduced maintenance charges, but of increased earnings? The car department can do very much to facilitate car movement and increase the miles run per car per year.

The Report of the Coupler Committee

The vote of thanks to the Coupler Committee, which was adopted at Tuesday morning's session, is particularly appropriate. The work which this committee has done has been of the highest order throughout and the amount of labor involved must have been enormous. W. L. Kleine, the chairman of the committee, deserves special thanks, and the various manufacturers have been of great assistance to the committee by their hearty co-operation. There has seemed some fear on the part of a few railway men that the experimental couplers are too heavy, but it must be remembered that the strength of a coupler depends largely on the amount of metal in it and the committee has used every means of reducing the weight to the safe minimum, consistent with ample strength. Members should also bear in mind the requests and suggestions of the committee regarding the use of the experimental couplers. The committee believes that with proper co-operation it will be able to recommend a final standard coupler at the 1916 convention, and every member should take cognizance of the remarkable work of the coupler committee and make every effort to help it bring this about.

Box Car Doors

Considering the importance of the subject, the lack of discussion following the presentation of the report of the Committee on Car Construction is somewhat surprising. The subject is one which is growing in importance; in fact some of its phases are of immediate vital importance. The failure to discuss the section devoted to the design of a standard M. C. B. box car may be understood, since the details of the design presented can undoubtedly be better handled by the written discussion recommended by the committee. The lack of discussion on the section devoted to car doors and fastenings, however, is not so readily understood. The committee has now presented reports on this subject at two conventions, requesting a thorough discussion of its recommendations. Neither last year nor this year did the matter receive the attention which its importance would seem to warrant. The protection of

lading both from the weather and against theft depends on the effectiveness of the car door and its fastenings, and the endeavor of the committee to formulate specifications to meet the requirements ought to be of general interest.

Maintenance of Air Brakes

The expression, 100 per cent operative brakes, is in some ways misleading, as was pointed out in the committee report on this subject presented by George H. Wood, of the Santa Fe, before the Air Brake Association last month. While a train may be operated with 100 per cent operative brakes, the efficiency of these brakes may be very low. The only way in which it will be possible to maintain the air brakes in the proper condition will be to give them thorough inspection and insist on their proper maintenance. Many times cars will be found cut-out in trains for apparently no reason. All the train crews should be instructed to report every car cut-out and the reason therefor; these reports to be given to terminal repairmen as soon as the train arrives at its destination. Another method of keeping the brakes in good condition and thus preventing air brake failures is to establish dead lines at various points on the road. This has proved satisfactory on the Santa Fe. At certain points all cars with inoperative brakes are held and the brakes are put in first-class condition before they are allowed to proceed. The practice of testing the brakes on incoming trains cannot be emphasized too strongly. It is evident that if this is done the defective brakes can be found and repaired with less amount of dead time to the cars and their lading than when the inspections are made on the outgoing tracks. Careful supervision and inspection is absolutely necessary and in order that all repaired triple valves may be in first-class condition when placed on the cars, it has been strongly recommended that the testing of them be done by a competent inspector rather than by the man who cleans them, many cases having been found where stenciled triples have become inoperative before their limit of service had expired.

THE CONSOLIDATION PROBLEM

PRESIDENT GAINES, of the Master Mechanics' Association, in his presidential address, strongly advocated the consolidation of all of the railway mechanical associations to the extent at least of having a governing body direct and supervise the work of all of them to prevent duplication and useless expenditure of energy, to insure the adoption of uniform standards, and to bring their work to as high a practical efficiency as possible.

A study of the programs of the two conventions at Atlantic City this year throws an interesting side light on such a movement so far as it concerns the work of the Master Mechanics' and Master Car Builders' Associations. Of the sixty items on the two programs, ten are identical although, except for safety appliances and the question of holding joint meetings, these items are largely matters of routine business. Of the 60 items, however, 38, or 63 per cent, are matters which could well be considered in joint session, while there are only 22—15 on the Master Mechanics' Association program and 8 on that of the Master Car Builders' Association—which are not suitable for joint discussion.

Whether a governing body directs the work of the associations, or a general mechanical association is formed with different sections meeting together or separately as the conditions at the time may warrant, or the two major associations continue on as they are but hold their meetings in the same week with a joint session during the middle of the week, is a matter for discussion. There can be no question, however, as to the desirability or even necessity of taking some measure immediately to secure greater co-operation on the part of all of the railway mechanical organizations. This has been realized for a long time, and we have consistently advocated it in our columns. The minor mechanical associations are doing excellent work, and yet in the majority of cases they feel the need of more recognition from the larger associations and would undoubtedly be glad to work with them with the idea of going thoroughly into the details of those questions with which they are most familiar and making definite recommendations to the major associations for approval and adoption as recommended practice or standards.

The time is now ripe for action. The question has been debated pro and con for a number of years and there should be very little trouble in securing some definite action. It only needs the right man or men to get behind the move and bring it to fruition. Will this be done?

TWO SUCCESSFUL CONVENTIONS

SEVERAL reports of more than ordinary importance were presented at both of the conventions this year. If the discussions were not as long or as extensive as might have been expected in some cases, this was apparently due to the fact that the committees had done their work particularly well, rather than because of any lack of interest. The committee reports were also especially well presented by the chairman who, practically without exception, used good judgment in placing the vital points before the members and using the time allotted to them to the best advantage. The new meeting room made a big difference, allowing the members to be seated to better advantage than in the old hall, and providing a seating capacity sufficient to easily take care of all of the members in attendance at any one meeting. The acoustic properties are better than those of the long narrow room which was used last year.

While the exhibitions were fewer in number than last year, over 70,000 square feet of space was used. It is doubtful if any exhibit has shown more new or improved devices, and from an educational viewpoint it could hardly be surpassed. It would appear that the railway men appreciated this and made good use of the opportunity of studying those devices which seemed to give promise of helping them to solve their special problems. We have heard many comments about the thorough way in which certain individuals and groups examined the exhibits with this in view.

The entertainment features were delightful. Simplicity and informality governed and in a quiet way the members seemed to thoroughly enjoy themselves. The weather man helped the entertainment committee out, we have had a little fog, a bit of rain on Sunday, but generally speaking the days were clear and warm.

It has been said that the pier was a little quiet, with less rush and bustle than in previous years. It is true that the total attendance has fallen off some, due in large part to the business depression, but the falling off in the registration of railroad men is small. It must be remembered, too, that the tone of the associations has been gradually changing in recent years. The problems up for consideration have steadily grown bigger and bigger, and have demanded more searching and technical examination and study. The effect of this is noticeable and undoubtedly the added responsibility has had some effect on the meetings as a whole.

As in recent years the attendance of government representatives was large. The presence of George B. McGinty, secretary of the Interstate Commerce Commission; H. W. Belnap, chief of the division of safety, and Messrs. McManamy, Robinson and Pack of the department of locomotive boiler inspection, with a large number of inspectors from both the safety appliance and boiler departments cannot help but develop a closer co-operation and better understanding between the representatives of the government and the railways.

Taken all in all those who were in charge of the planning of and carrying out of the meetings can well afford to be proud of the outcome.

TODAY'S PROGRAM

WEDNESDAY JUNE 16, 1915

Discussion of reports on:	
Train lighting and equipment.....	9.30 A. M. to 10.00 A. M.
Car trucks	10.00 A. M. to 10.30 A. M.
Draft gear	10.30 A. M. to 10.45 A. M.
Joint meeting with A. R. M. M. Assn.	10.45 A. M. to 11.00 A. M.
Individual paper—Impact between freight cars in switching service. By Prof. L. E. Endsley	11.00 A. M. to 11.30 A. M.
Topical discussion: Air brake maintenance	11.30 A. M. to 11.45 A. M.
Unfinished business; Reports of Committees on Correspondence, Resolutions and such other committees as may be named during the convention	11.45 A. M. to 12.00 M.
Election of officers	12.00 M. to 1.30 P. M.

LOST

Badge 3584 has been lost. Finder will kindly return to Secretary Conway.

OBITUARIES

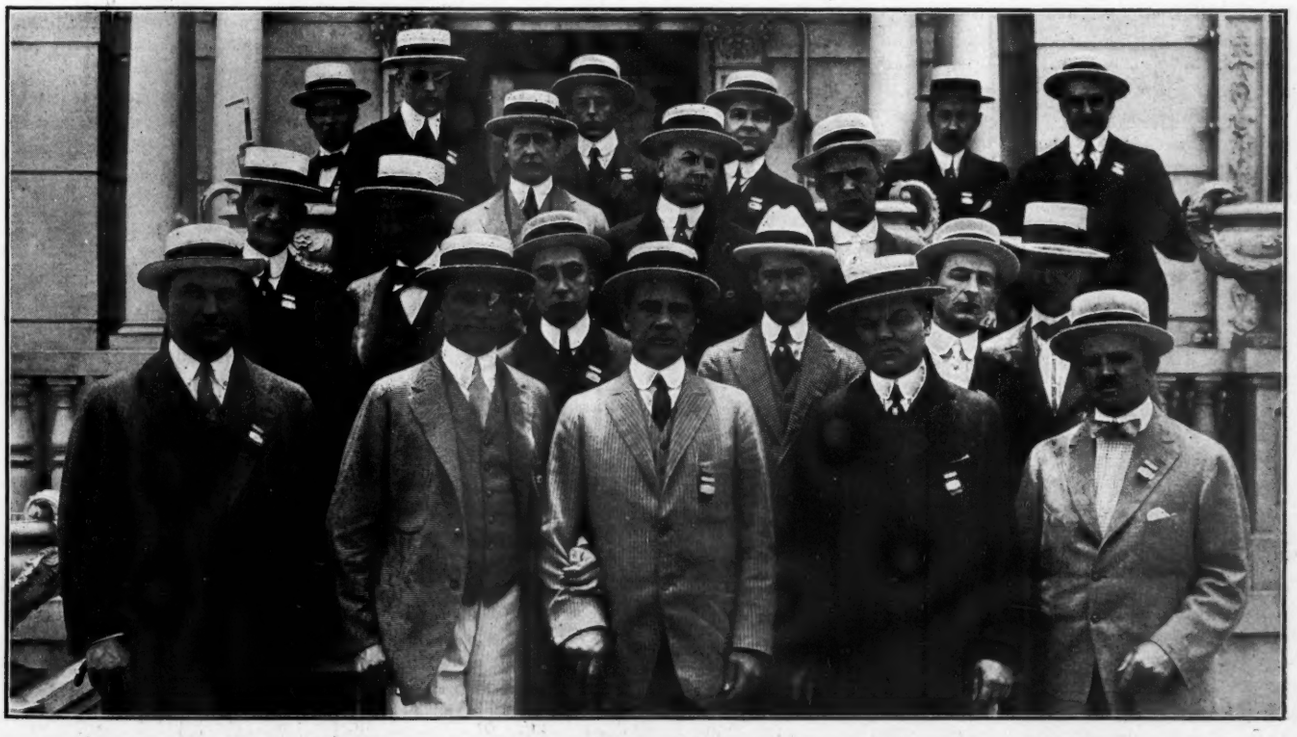
President Crawford has appointed committees to draw up obituaries for the following members who died during the past year. Active Members: P. P. Mirtz, Lake Shore & Michigan Southern; C. J. McMasters, Rutland Railroad; H. R. Payne, Union Tank Line; F. W. Chaffee, New York Central & Hudson River; H. C. Bossinger, Chesapeake & Ohio Representative Members. T. E. Adams, St. Louis Southwestern; A. Stewart, Southern Railway; E. C. Hawkins, Copper River Railway; S. D. Freshman, Sierra Railway of California; E. A. Miller, New York, Chicago & St. Louis; H. C. Millis, Western Live Stock Express. Life Members: J. P. Levan, Pennsylvania Railroad; B. Welsh, Southern Pacific, and C. Wicks, Cumberland Valley.

A HANDSOME PRESENT FOR CHAIRMAN CARR

On Monday evening, just before the informal dance on the Pier began, Chairman George R. Carr, of the entertainment committee, was lured to the porch of the booth of the Dearborn Chemical Company, of which he is vice-president. When he arrived he found the members of the entertainment committee assembled, and in a short address expressing the committee's pleasure in having worked with him, and its appreciation of the efficiency of his efforts, Gilbert E. Ryder, on behalf of the committee, presented Mr. Carr with a gold pocket knife with a gold and platinum chain. On one side of the knife is engraved Mr. Carr's name and on the other the words "Entertainment Committee M. M. and M. C. B. 1915." The present is a handsome one and is highly appreciated by its recipient.

PAST PRESIDENT'S BADGE FOR J. WILL JOHNSON

At the noon meeting yesterday of the executive committee of the Railway Supply Manufacturers' Association, C. B. Yardley, Jr., chairman of the badge committee, in a happy speech, presented on behalf of the committee to J. Will Johnson, the retiring president of the association, a past president's badge. This is the sixteenth past president's badge which has been presented on behalf of the association. Mr. Yardley paid high tribute to the hard and efficient work in various capacities which Mr. Johnson has done over a long period of years to



ENTERTAINMENT COMMITTEE

Top Row, Left to Right—Langley Ingraham (Yarnall Paint Co.); W. H. Bentley (Curtain Supply Co.); Wm. W. Melcher (Mass. Mohair Plush Co.); R. J. Faure (Commercial Acetylene Railway Light & Signal Co.); F. H. Thompson (Railway Age Gazette); G. E. Ryder (Locomotive Superheater Co.).

Second Row—C. C. Farmer (Westinghouse Air Brake Co.); D. E. Sawyer (Illinois Steel Co.); M. G. Baker (American Vanadium Co.); Albert MacRae (MacRae's Blue Book); J. F. Forney (Ralston Steel Car Co.).

Third Row—C. W. F. Coffin (Franklin Railway Supply Co.); W. K. Krepps (Crucible Steel Co.); G. R. Berger (Gould Coupler Co.); J. P. Landreth (Garlock Packing Co.).

Fourth Row—H. N. Scott (Griffin Wheel Co.); J. F. A. Comstedt (Atlas Automatic Jack Corporation); George R. Carr, Chairman (Dearborn Chemical Co.); A. B. Wegener (Camel Co.), and Burton W. Mudge (Burton W. Mudge & Co.).

make the undertakings of the Supply Association successful. He said in part:

"Your training in the way of the railroad man, having yourself gone through the life that knows no hours, whose requirements are sincerity, loyalty, perseverance and unfeeling devotion to duty, a willingness to surmount each difficulty with but one thought in view, has indeed fitted you for the duties you have so conscientiously and happily fulfilled. We trust that you will keep this badge as an emblem without price that represents the personality, friendship and good will of the association. I bespeak for this organization and for this committee the continuance of that interest in our welfare which has been so marked in the past, that often we may greet you and always count you as our friend."

FIFTH DAY'S REGISTRATION FIGURES

The registration figures up to Monday evening, the first day of the M. C. B. convention, and the fifth of the meetings of the two associations, make a very satisfactory showing regarding the attendance of railway men. The statistics, compared with those covering the same period of the immediately preceding four years, are as follows:

	1911	1912	1913	1914	1915
Members M. C. B. & M. M.	719	644	678	730	713
Special Guests	832	583	680	554	505
Railroad Ladies	705	437	505	433	403
Supply Ladies	385	223	308	287	232
Supply Men	1662	1516	1666	1484	1248
Total	4303	3404	3837	3488	3103

It will be seen that the registration of railway men has been only slightly smaller than in 1911 and 1914, and has been substantially larger than in 1912 or 1913. There has been a heavy decline in the registration of special guests since 1911, but this probably is almost entirely due to a reduction in the liberality with which these badges are handed out. Comparing with 1914, the reductions in the registration are as follows: Railway men, 17; special guests, 49; railroad ladies, 30; supply ladies, 55; supply men, 176; total reduction, 385.

The reduction in the registration of supply men is much smaller now than it was on the first day of the Master Mechanics' convention, owing to the fact that many concerns which are interested chiefly in the M. C. B. Convention did not have their representatives come until this week.

THE ASSOCIATIONS INDORSE PRESIDENT WILSON'S POLICY

The Master Car Builders' Association and the Railway Supply Manufacturers' Association yesterday took action indorsing President Wilson's policy in dealing with the Imperial German Government.

D. R. MacBain introduced at the meeting of the M. C. B. Association the following resolutions, which were adopted unanimously in a storm of applause, and ordered telegraphed to the president at Washington:

"The Master Car Builders' Association of America, comprising the mechanical officials of the railways of the United States, in session at Atlantic City, New Jersey, send you assurance of its enthusiastic approval of the notes despatched by you to the Imperial German Government, calling for the maintenance inviolate of all rights of American citizens on the high seas.

"Regardless of the political affiliations of its members, the Association, as one man, applauds the patriotism of your course and the wisdom of your utterances during this critical period of the progress of the dreadful European war.

"We profoundly sympathize with you in the heavy burden of responsibility you are bearing for your fellow-countrymen at this juncture so devotedly and courageously. At this time every American should stand heart and soul with our President."

When the executive committee of the Railway Supply Manufacturers' Association heard of the action taken, it drew up and sent to the M. C. B. Assocation the following communication:

Atlantic City, N. J., June 15th, 1915.

Mr. D. F. Crawford, President,
Master Car Builders' Association,
Atlantic City, New Jersey.

Dear Sir:

The Executive Committee of the Railway Supply Manufacturers' Association indorses with the same enthusiasm the resolution adopted by your association to be sent to the President of the United States, in reference to his notes to the Imperial German Government, and begs to have its indorsement included in your resolution.

Respectfully submitted,

J. WILL JOHNSON, *President,*
C. E. POSTLEWAITE,
F. M. NELLIS,
For the Executive Committee.

This communication was received and included in its minutes by the M. C. B. Association.

THE TRACTION STRIKE IN CHICAGO

The convention visitors from Chicago have been reading with interest the newspaper accounts of the strike of employees of all the elevated railways and surface street railway lines which has been declared in that city. The extremely large area which Chicago is spread out over and other conditions make such a strike there especially serious. It appears from the newspaper reports that on Monday, the first day of the strike, not a wheel turned on the surface lines and only a few trains ran on the elevated lines. One result was an enormous increase in the traffic handled by the steam suburban lines. The Illinois Central ordinarily handles 40,000 suburban passengers a day. The newspapers state that on Monday it handled 280,000. It is evident that while the strike lasts the steam railways will profit by it, but on the other hand the increase in the difficulties under which they operate will be something enormous because of the immense increase in the service which they will have to render without any proportionate increase in their facilities.

THE MUSIC THIS YEAR

The music on the Million Dollar Pier during the mornings and afternoons and for the informal dances in the evenings has excited considerable favorable comment and is probably the best ever had at the conventions. The orchestra is not as large as some of those employed in previous years, but this is not apparent in the volume or effect because of the ability of the individual players and the skillful way in which they are directed. The orchestra is known in New York City, where it has been playing for three years, as the Don Richardson Society Orchestra and makes a specialty of playing at private and club affairs only, probably doing more of this than any other orchestra.

Those who have enjoyed some of the Indian compositions will be interested in knowing that after leaving the University of North Carolina, Mr. Richardson traveled in the Far West and Mexico and spent considerable time at Yuma, where his uncle was stationed as the United States collector of customs. This gave him the opportunity of studying the customs and habits of the Yuma Indians, and his knowledge of their sacred sun dances, snake dances, rain dances, etc., undoubtedly inspired his Papoose Dance, Intermezzo, Cradle Songs and Indian Overture.

Mr. Richardson was the first to adapt the two well-known songs "A Perfect Day" and "Mighty Lak' a Rose" as hesitations in September, 1914. He has also published the Athene Waltz and the Zum one-step, both of which are extensively used throughout the country.

Master Car Builders' Association Proceedings

Reports on Couplers, Rules for Loading Materials, Car Construction, and Specifications and Tests for Materials

President Crawford called the Tuesday morning to order at 9.45. The report of the Auditing Committee was received and approved.

COUPLERS

The course of the committee during the past year was as follows:

A. Road Tests; continuation of the road-service tests on "Present" and "Experimental" types of couplers begun since the inception of this work.

B. Road Tests; results of the recommended road-service tests or trials of the *A* and *B* couplers by the members of the Association.

C. Dynamic and Static Tests.

D. Service Machine.

E. Angling and Coupling.

F. Jiggling or Lock-creeping.

ROAD TESTS

The road-service tests on "Present" (couplers in general use) and "Experimental" types of couplers inaugurated during the early investigation and development stage of the committee work were continued. Each coupler was given a letter designation, to represent the name or type of the coupler tested, as well as the manufacturer. Couplers Ta, Ua, Wa, Xa, Ya and Yc represent couplers of the present types in general service, such as Pitt, Sharon, Major, Simplex, Latrobe and Gould "Z," irrespectively, and couplers Tb, Xe, Yb, Yd, Yda and Ydb represent couplers of increased weight and strength in the development stage, termed "Experimental," a number of each of which were placed in service experimentally.

R. L. Kleine
Chairman, Committee on Couplers

These road-service tests were conducted with couplers of "Present" type on freight cars, and with couplers of both present and the experimental design on freight locomotive tenders on the Pennsylvania Railroad. The freight car couplers were applied to 100,000-lb. capacity steel hopper cars in the coal trade between the bituminous mines in Western Pennsylvania and tidewater, a service comprising grade and flat country as well as hump-yard classification. The tender couplers were applied to 7000-gal. steel tenders in general heavy freight service on the Western Pennsylvania Division, between Altoona and Pittsburgh, which includes heavy-grade service.

These couplers were measured once every month, to determine their operation and ability to withstand service, and thus draw comparisons between the static and dynamic tests with road-service tests.

The road test of couplers on tenders in freight service develops in the shortest space of time the defects as well as the relative life of couplers. From the test results it was surprising to note the short life, before repairs are required, of couplers of the "present" type in this service, as well as the relatively longer life that is being obtained from the "experimental" couplers. The following couplers were tested:

Freight Tender Couplers:

3 Xa couplers (present type), applied July, 1912.
2 Xa couplers (present type), applied 3-26-13 and 4-3-13, respectively, to replace above Xa couplers removed.
3 Ya couplers (present type), applied July, 1912.
12 Tb couplers (experimental type), applied July, 1912.
6 Yb couplers (experimental type), applied August, 1912.
6 Yb couplers (experimental type), applied November, 1912.
6 Yd couplers (experimental type), applied August, 1912.
6 Yda couplers (experimental type), applied June, 1913.
6 Ydb couplers (experimental type), applied June, 1913.
1 Xe coupler (experimental type), applied February 21, 1913.

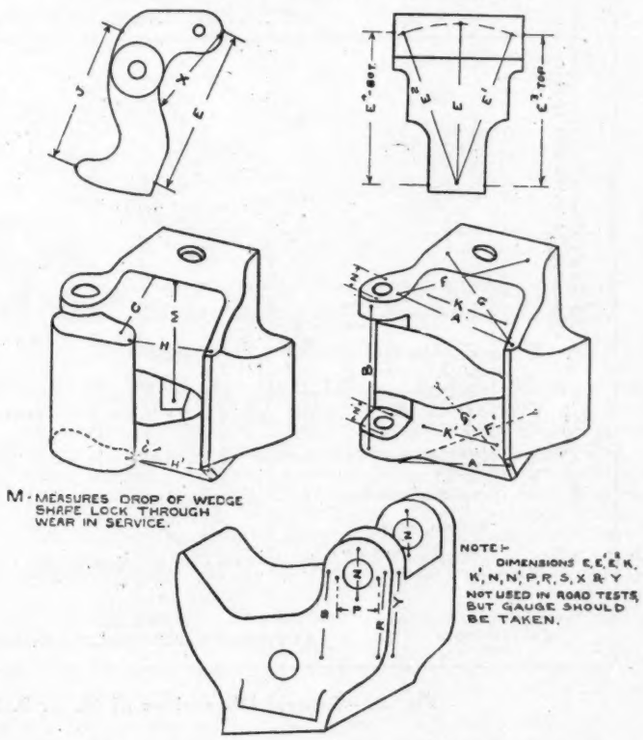


Fig. 1.—Tramming Points on M. C. B. Test Couplers

Freight Car Couplers:

2 Ta couplers (present type), applied July 28, 1912.
2 Ua couplers (present type), applied July 28, 1912.
2 Wa couplers (present type), applied July 28, 1912.
2 Xa couplers (present type), applied July 28, 1912.
2 Ya couplers (present type), applied July 28, 1912.
2 Yc couplers (present type), applied July 28, 1912.

The following table gives the "set" found at *C*, *H*, and *E* of various couplers in service on locomotive tenders:

Class	Type	Date Installed	Date of Last Test	C	C^1	H	H^1	E^3	E^4	Top Gage	Bottom Gage
Tb	Experimental	7-1-12	4-13-15	+.24	+.14	+.24	+.23	—.08	—.04	$51\frac{1}{32}$	$51\frac{1}{32}$
Yd	Experimental	8-1-12	3-14-15	—.10	—.04	+.07	+.04	—.09	—.06	$41\frac{9}{32}$	$49\frac{1}{16}$
Yda	Experimental	6-13-13	3-25-15	+.15	+.23	+.30	+.19	—.03	—.01	$47\frac{1}{4}$	$42\frac{7}{32}$
Ydb	Experimental	6-12-13	4-6-15	—.04	—.05	—.04	—.02	—.05	—.04	$45\frac{5}{8}$	$45\frac{5}{8}$
Ya	Present	7-8-12	4-16-15	+.12	+.11	+.12	+.15	+.19	+.10	5	$5\frac{1}{16}$

ROAD TESTS—*A* AND *B* COUPLERS

The road tests which are being conducted to develop the operation of the couplers in service as well as the breakages of

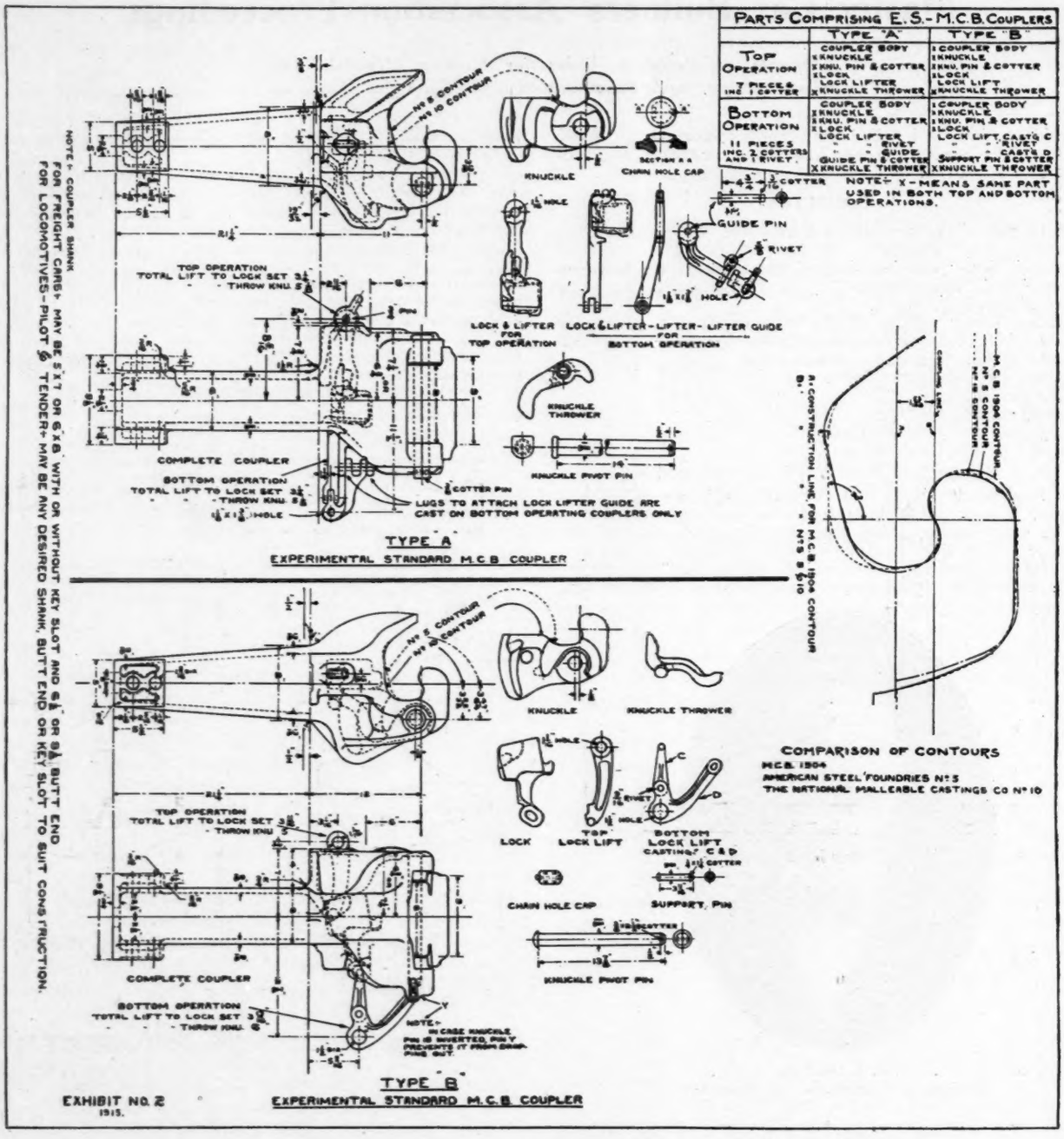


Fig. 2.—General Dimensions of M. C. B. Experimental Couplers, Types A and B

The following is a Summary of measurements, showing the permanent set at *C*, *H* and *E*, of 12 freight car couplers of the "present" type. They were applied July 28, 1912. Nine of the twelve couplers are still in service.

Coupler	Date	Time in Service	Set—Plus or Minus Inches—From Original Dimension						Gage	
			C	C^1	H	H^1	E^2	E^3	Top	Bot.
Ta	4-6-15	32 Mo. 10 Da.	+.28	+.24	+.08	+.16	+.06	+.05	$4\frac{31}{32}$	$4\frac{7}{8}$
Ta	4-6-15	32 Mo. 10 Da.	+.26	+.11	+.11	+.16	+.07	+.07	$4\frac{15}{16}$	$4\frac{3}{4}$
Ua	4-26-15	33 Mo.	+.35	+.37	+.17	+.36	+.17	+.13	$5\frac{1}{32}$	$5\frac{1}{8}$
Ua	10-17-14	26 Mo. 19 Da.	+.20	+.12	+.02	+.07	+.15	+.13	$5\frac{1}{32}$	$5\frac{1}{8}$
Wa	3-22-15	31 Mo. 26 Da.	+.24	+.41	+.28	+.38	—.04	Lost	$5\frac{1}{16}$	$5\frac{1}{8}$
Wa	8-10-14	24 Mo. 13 Da.	+.23	+.33	+.18	+.34	—.07	+.17	$4\frac{29}{32}$	$4\frac{15}{16}$
Xa	3-22-15	31 Mo. 26 Da.	+.16	+.07	+.12	+.11	—.04	—.06	5	$4\frac{29}{32}$
Xa	3-22-15	31 Mo. 26 Da.	+.20	+.20	+.12	+.15	+.03	+.03	$4\frac{15}{16}$	5
Ya	9-28-14	26 Mo.	+.28	+.29	+.19	+.23	+.13	+.11	$4\frac{29}{32}$	$4\frac{31}{32}$
Ya	3-29-15	28 Mo. 28 Da.	+.30	+.34	+.22	+.37	+.09	+.11	$4\frac{29}{32}$	$5\frac{1}{16}$
Yc	4-13-15	32 Mo. 17 Da.	+.32	+.43	+.17	+.27	+.15	+.17	$4\frac{29}{32}$	$4\frac{31}{32}$
Yc	4-13-15	32 Mo. 17 Da.	+.44	+.45	+.18	+.41	+.13	+.24	$5\frac{1}{32}$	$5\frac{1}{16}$
Average		30 Mo. 11 Da.	+.272	+.280	+.153	+.251			$4\frac{31}{32}$	$4\frac{31}{32}$
			+.276		+.202				$4\frac{31}{32}$	

couplers and parts, are of equal, if not greater, importance than the static and dynamic tests. Many of the existing couplers operated perfectly when first designed or placed in service, and will continue to do so until affected by wear and distortion of parts, and it has required in the past from two to three years' service to develop these conditions. The committee, therefore, can not impress too strongly upon the members of this Association the absolute necessity of not only placing a sufficient number of these experimental standard couplers in service from which to draw proper conclusion, but to follow up particularly

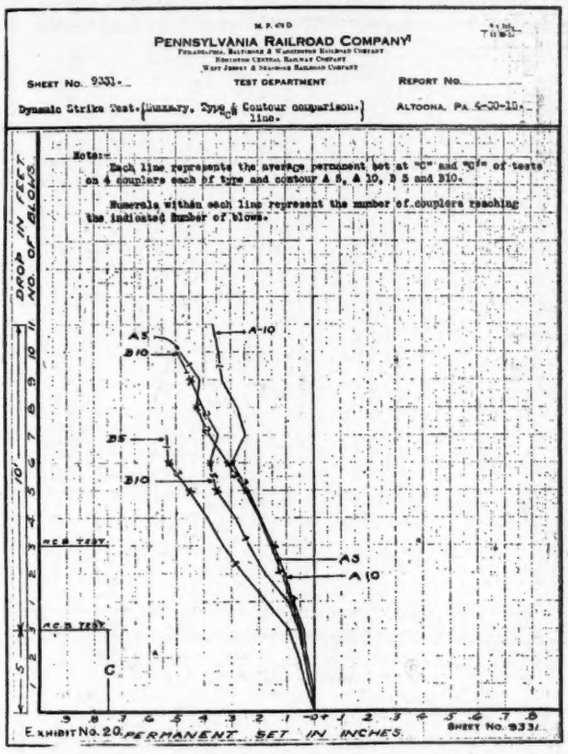


Fig. 3.—Set of *C* Line in Dynamic Strike Test

the operation and what takes place under the conditions of wear and distortion.

Thus far the couplers have not been in service a sufficient length of time to determine all the weak points or the seriousness of the defects that have developed. This is also the consensus of opinion expressed in preliminary reports received from 32 railroads having these couplers in service.

There are now 3,713 experimental couplers in service as follows: 933 type A, contour No. 5; 793 type A, contour No. 10; 138 type A pilot couplers; 704 type B, contour No. 5; 1,001 type B, contour No. 10, and 144 type B pilot couplers.

The Pennsylvania Railroad placed 30 each of the Type A and B Experimental Standard M. C. B. couplers in road locomotive tender service during the early summer of 1914. These couplers had a 5 in. by 7 in. special shank and were applied to 7000-gal. capacity steel tenders, attached to Consolidation type freight locomotives of 46,290 lb. tractive effort, in general freight service on the Eastern and Western Pennsylvania Grand Division, between Philadelphia and Pittsburgh, which includes ordinary as well as heavy grade serv-

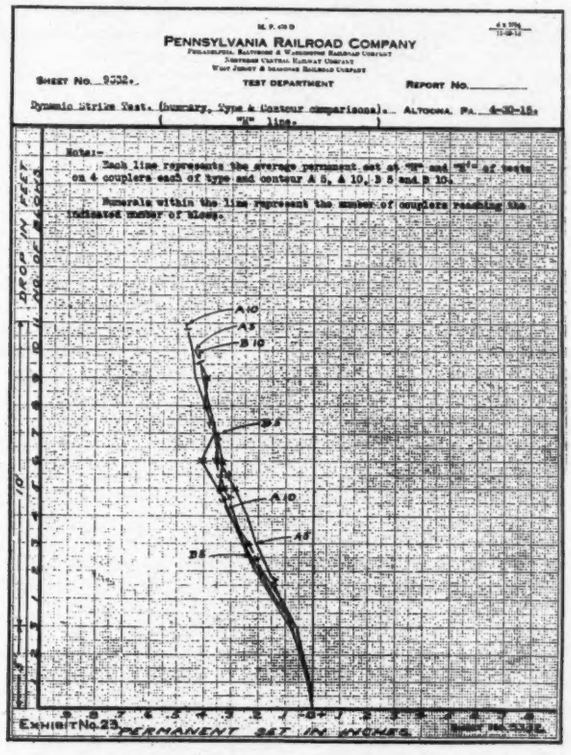


Fig. 4.—Set of *H* Line in Dynamic Strike Tests

ice. One coupler of each type and contour (total, 4) was applied to steel tenders attached to latest type passenger locomotives. Six couplers of each type and contour (total, 24) were laid off as per Fig. 1, the bar plates labeled and all parts plainly stenciled. Four of these couplers in each type and contour (total, 16), which had been laid off, were inspected and measured once every month. The remaining couplers (44) had all parts stenciled and were also inspected every month. Below is given the last measurement only of the couplers in the groups of A-5, A-10, B-5 and B-10 couplers, being measured regularly:

Type	Contour	Bar No.	Service	Date Applied	Date Last Tested	A	A^1	C	C^1	Measurements H	H^1	G	G^1	E^3	E^4	Repairs
A	5	757	Freight	7-3-14	4-9-15	0	—.01	+.04	+.03	+.08	+.05	+.03	+.02	+.04	—.02	None
A	5	758	Freight	7-2-14	4-7-15	—.06	—.01	+.11	+.02	—.02	+.04	0	+.01	—.06	+.01	None
A	5	756	Passenger	6-3-14	4-29-15	0	0	+.06	—.02	+.04	+.05	0	0	—.01	0	None
A	5	759	Freight	7-3-14	2-9-15	0	0	+.08	—.01	+.10	+.07	+.01	0	—.01	0	Shank bent
A	10	772	Freight	7-7-14	4-15-15	+.22	+.12	+.06	+.10	+.32	+.27	+.13	+.04	—.12	—.01	None
A	10	771	Passenger	6-29-14	4-7-15	—.06	—.04	+.08	0	—.01	+.05	+.01	+.02	—.02	—.01	None
A	10	773	Freight	7-3-14	12-4-14	0	0	+.08	+.06	+.06	+.11	0	0	—.02	—.01	Shank bent
A	10	774	Freight	7-7-14	3-1-15	+.11	—.06	—.03	—.07	+.13	—.03	+.10	+.03	—.10	—.05	None
B	5	728	Freight	5-28-14	4-7-15	+.08	+.15	+.17	+.15	+.25	+.31	+.06	+.08	—.01	+.01	None
B	5	726	Passenger	5-21-14	4-8-15	+.01	0	+.09	+.17	+.14	+.11	0	0	0	0	None
B	5	729	Freight	5-28-14	4-7-15	+.06	....	+.12	+.15	+.20	+.12	+.12	+.02	—.06	—.02	None
B	5	730	Freight	5-27-14	4-8-15	+.06	+.05	—.06	—.02	—.02	—.03	+.06	+.03	—.03	—.03	Knuckle cracked
B	10	742	Freight	5-27-14	4-8-15	+.13	+.01	+.05	+.23	+.24	+.16	+.09	0	—.01	+.01	None
B	10	741	Passenger	5-21-14	4-14-15	+.02	—.01	+.05	+.10	+.14	+.09	+.02	—.03	—.07	—.02	None
B	10	743	Freight	5-27-14	11-4-14	0	0	+.01	+.10	+.04	+.05	0	0	—.01	—.01	None
B	10	745	Freight	5-28-14	4-12-15	+.02	0	—.03	+.13	+.06	+.06	+.03	0	—.06	0	None

The following table gives a report in condensed form of the operation of the *A* and *B* couplers in locomotive service on the Pennsylvania Railroad up to May 1, 1915:

ITEM.		COUPLER AND CONTOUR			
		A-5	A-10	B-5	B-10
....	Total number in service	57	57	57	15
....	Total number closely examined	39	38	38	13
1	Operate good	11	12	27	1
2	Operate fair	6	3	9	7
3	Operate fair, but do not throw satisfactorily	..	..	2	..
4	Operate fair, but throws knuckle poorly	4	8	..	3
5	Operate poorly	..	..	..	2
6	Operate poorly; does not throw knuckle satisfactorily and lock jams knuckle	2	..	..	..
7	Operate poorly; does not throw knuckle satisfactorily and lock sticks between lock-set and full open position but disturbs when knuckle is pulled open	13	13	..	..
8	Operate poorly; does not throw knuckle satisfactorily and lock sticks between lock-set and full open position, from which the lock disturbs only occasionally	1	1	..	..
9	Throws knuckle poorly; knuckle thrower interferes with top wall of coupler head	1	..	..	..
10	Lock sticks above lock-set position but disturbs, lock also jambs knuckle when closing	..	1	..	..
11	Operate poorly due to being tight between coupler ears	1	..	..	..

The defects on the P. R. R. on the type *A* couplers were more varied and numerous than were found on the *A* couplers

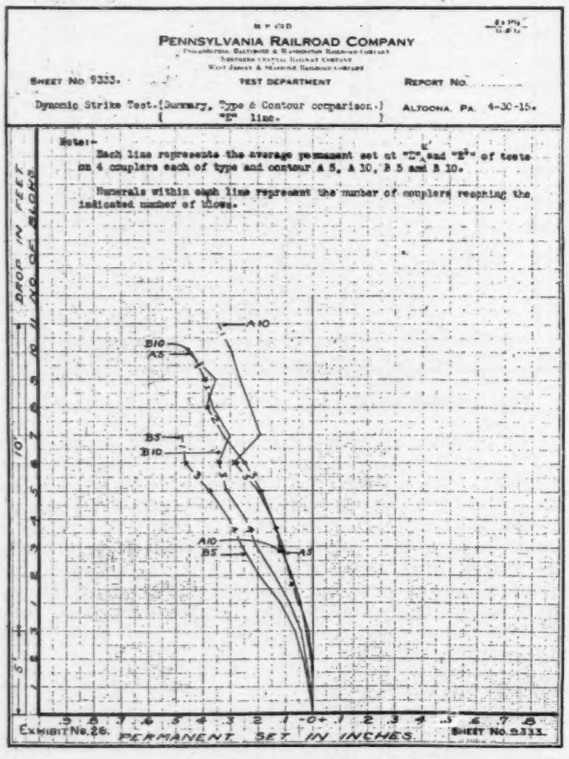


Fig. 5.—Set of *E* Line in Dynamic Strike Test

on the Norfolk & Western during the joint inspection, week of March 8, 1915.

At a joint inspection meeting of the Type *A* and *B* couplers in service on the Norfolk & Western by the committee and the coupler manufacturers H. W. Coddington of the N. & W. stated that road had the Types *A* and *B* couplers on the 750 90-ton steel gondola cars, as well as on the electric locomotives, and that the service being obtained from the couplers was very satisfactory. Mr. Coddington read a statement of couplers and separate knuckles removed to date from service, giving record of particulars in each case of the 33 couplers, 12 knuckles, 1 lock and lifter, and 1 knuckle thrower removed, as well as defects in some couplers still in service which do not yet warrant their removal. The N. & W. test department has examined one or more times the couplers on 607 of the 750 cars, and are very well satisfied with the service being obtained from them. Operation defects as yet minor in character have been found in both Types *A* and *B* couplers, but no trouble in operation has been reported by the transportation department.

It was found that practically all the couplers examined threw the knuckle open good. The principal defects found were as follows: Type *A* couplers, locks would stick in head above lock-set position in all but one examined; Type *B* couplers, lock fulcrum boss interferes with the front face in lifting lock, and the lock sticks in head above full open position. The interference of the fulcrum boss on the front of

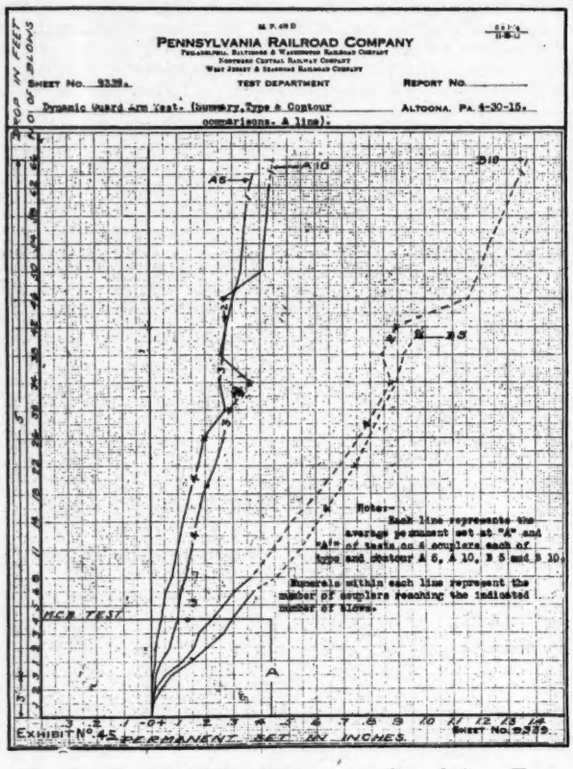


Fig. 6.—Set of *A* Line in Dynamic Guard Arm Test

the Type *B* lock with its pocket in front face of bar, when lifting lock, was only noticed on the couplers with the No. 5 contour. The cause of this is in part due to lack of clearance

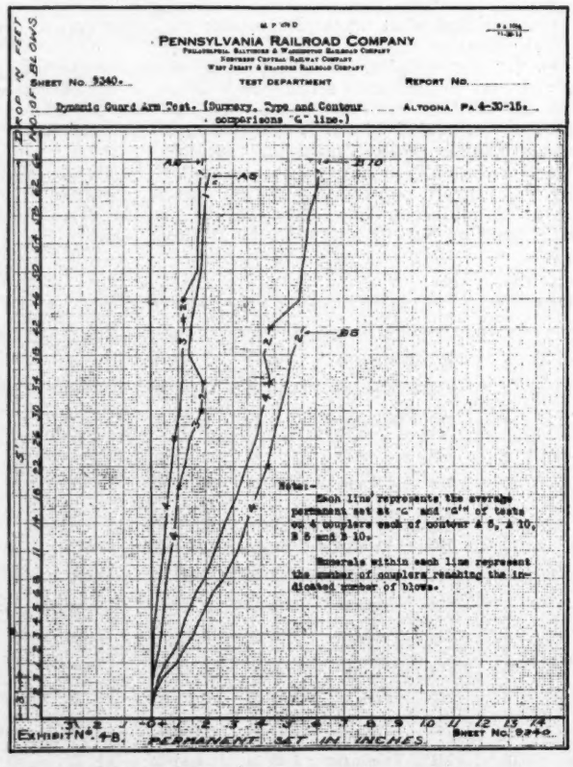


Fig. 7.—Set of *G* Line in Dynamic Guard Arm Test

and to the fact that the front face of bar over the pocket for the lock fulcrum on couplers of No. 5 contour is being dented inward somewhat, reducing the available clearance.

The sticking of the Type *B* lock above the locked position on couplers, with both the No. 5 and No. 10 contour lines, was brought about, in a few cases, by a quick jerk of the lever (the same as in service) in throwing the knuckle com-

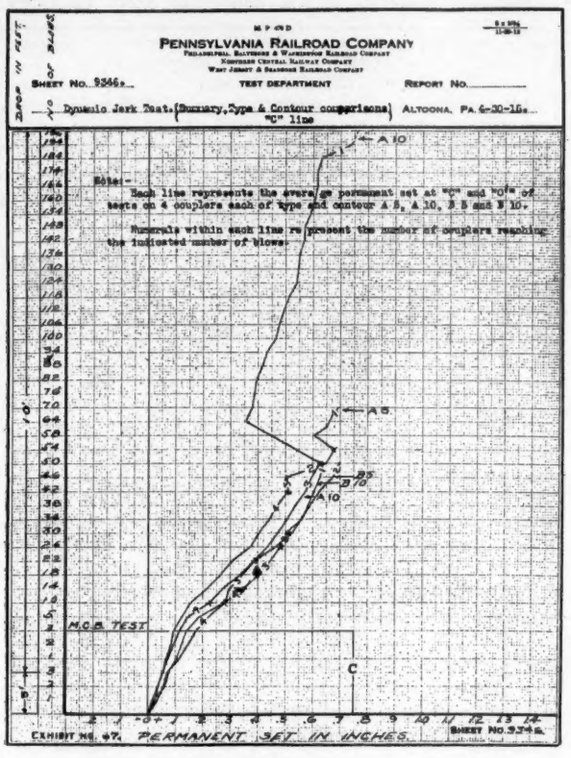


Fig. 8.—Set of *C* Line in Dynamic Jerk Test

pletely open; whereas, in the other cases where this was noted, it required repeated jerks of the uncoupling lever after the knuckle had been thrown to the full open position, and

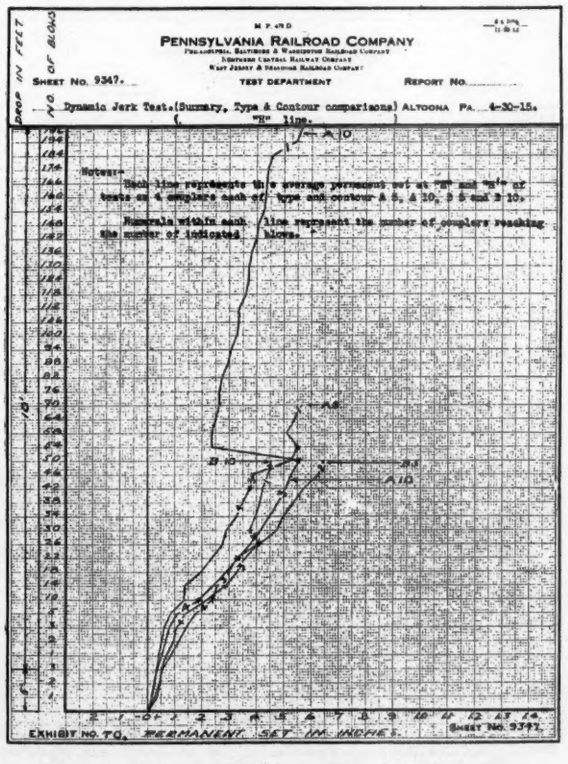


Fig. 9.—Set of *H* Line in Dynamic Jerk Test

bringing the uncoupling lever slowly to rest position, for if the lever was allowed to drop naturally, the lock would generally drop to the proper full open position. The cause of this sticking, as far as it was possible to determine, is due to insufficient clearances.

The following are some of the causes for removal of the experimental couplers on the Norfolk & Western: Type B-5—The knuckle was apparently bent inward about ½ in. and top of guard arm bent ⅜ in. Coupler inoperative on account of binding between lugs. No damage to car except striking plate bent inward ⅜ in. Conditions unknown.

Type B-5—Guard arm broken off at Lambert's Point. Conditions unknown. Guard arm broken off in making coupling at Lambert's Point. End sill plate bent ¾ in., carrier iron renewed and center sill bent out on knuckle side. Guard arm broken off at Lambert's Point. Reported no signs of rough handling.

Type A-10—Removed at Roanoke Shops account of hard blow on top of knuckle face and top lug causing binding between coupler lugs. Guard arm bent out ½ in. at top. Head crushed causing kicker to bind on trunnions making coupler inoperative. Shank bent 1¾ in. Vertical lock guide, knuckle side, broken. This occurred at Lambert's Point 5-23-14 in run-away with car 100069, but was reapplied to the car in error.

Type B-10—Bottom lug pulled from head. This occurred at Bluefield with report as appeared to be due to rough handling.

Type B-5—Broke both lugs, breaking through mouth of

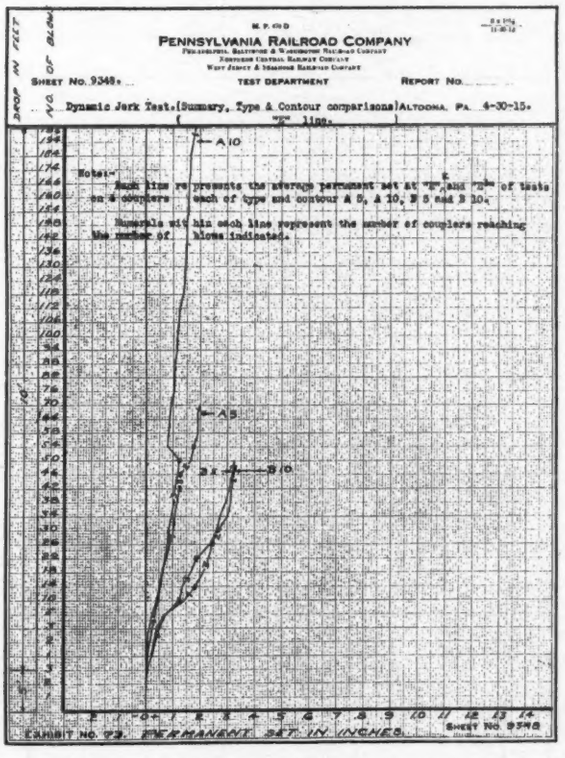


Fig. 10.—Set of *E* Line in Dynamic Jerk Test

bar; lugs and knuckle lost. Occurred west of Bluefield. Conditions unknown.

Type A-5—Burst head. Top wall cracked open forward of lifter hole and down inside of front top face. Marks as would be made by mating coupler guard arm on front face. Removed at Bluefield, car shows no signs of rough handling.

Type A-5—Top of head mashed in so the lock could not go up higher and let the knuckle throw. Also head cracked on inside from mouth of bar to top of head. Coupler does not seem to have had any unusually hard service.

Type B-10—Knuckle broke through pin hole on first car in train. Caused by 90 car west-bound train parting thirty cars back of locomotive and air went on in emergency at Walton, Va. Front half of knuckle lost. Knuckle broke through pin hole at Bluefield. Reported rough handling.

Reports were also received from other roads that are using the experimental couplers—[Editor].

In connection with the question of slack in the *A* and *B* couplers, of both Nos. 5 and 10 contour, an investigation was made on these couplers on an empty train of fifty Norfolk & Western 90-ton capacity steel gondola cars. The cars were all coupled and the train was coupled to a long train

of steel hopper cars loaded with coal, and brakes set on a number of the latter. The train of 50 N. & W. cars upon which the investigation was being conducted was then thoroughly stretched with a locomotive and brakes set on locomotive and several cars next to it, to insure the stretching. Each coupler was centrally punched on top of the head just back of the face and on the longitudinal center line of coupler and the distance trammed. The train was then bunched and the distance between the center-punched marks of each coupling above referred to was again trammed, the difference between this distance and the original distance as laid off with cars stretched being the slack per coupling. These cars and couplers had an average service of a little over nine months at time of these measurements.

The cars were equipped with the Sessions Friction Draft Gear (Type *K*), with the coupler horn originally set 1⅞ in. from the striking plate. The total slack in train consisting of 49 couplings, including couplers and drafts between buffed and stretched positions, was 26 ft. 10½ in., of which 4 ft. 8$\frac{5}{32}$ in. were in the couplers themselves. The following table is a summary of the results:

Couplings. Number.	Type Couplers and Contours Coupled.	Slack per Coupling. Minimum.	Average.	Maximum.
5	A-5 with A-5.....	1.062	1.156	1.281
2	B-5 with B-5.....	.969	.969	.969
5	A-10 with A-10.....	1.219	1.306	1.438
4	B-10 with B-10.....	1.000	1.156	1.281
3	A-5 with B-5.....	1.062	1.135	1.187

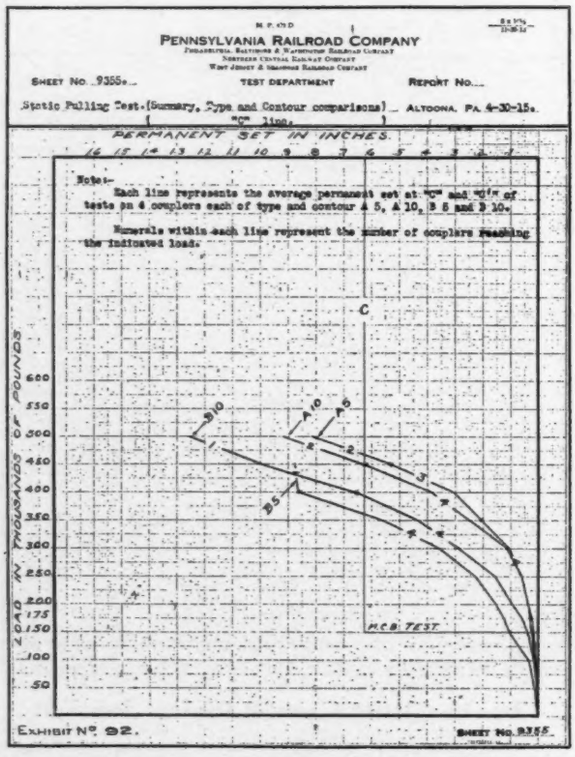


Fig. 11.—Set of *C* Line in Static Pulling Test

5	A-5 with A-10.....	1.062	1.187	1.344
4	B-5 with B-10.....	.875	.992	1.094
5	A-10 with B-10.....	1.187	1.319	1.375
9	A-5 with B-10.....	.937	1.093	1.250
7	B-5 with A-10.....	.844	1.076	1.250
10	No. 5 with No. 5.....	.....	1.112	.....
14	No. 10 with No. 10....	.....	1.268	.....
25	No. 5 with No. 10.....	.....	1.091	.....

DYNAMIC AND STATIC TESTS

The tests mentioned in report of last year as necessary to be made upon the Types *A* and *B* Experimental Standard M. C. B. couplers of both sizes of shank—5 in. by 7 in. and 6 in. by 8 in.—and both contours—Nos. 5 and 10—have been completed recently, and the results are shown in plotted form in Figs. 3 to 16 inclusive. The couplers were laid off the same as in previous tests, as per Fig. 1 and measured after each drop or increment of load. These tests were conducted by the Pennsylvania Railroad Company at Altoona, under the direct supervision of C. D. Young, Engineer of Tests, and the chairman of this committee.

SERVICE TESTING MACHINE—FINAL TESTS

As a result of the tests on the Types *A* and *B* couplers in the service test machine conducted during January and February, 1914, at the works of the American Steel Foundries at

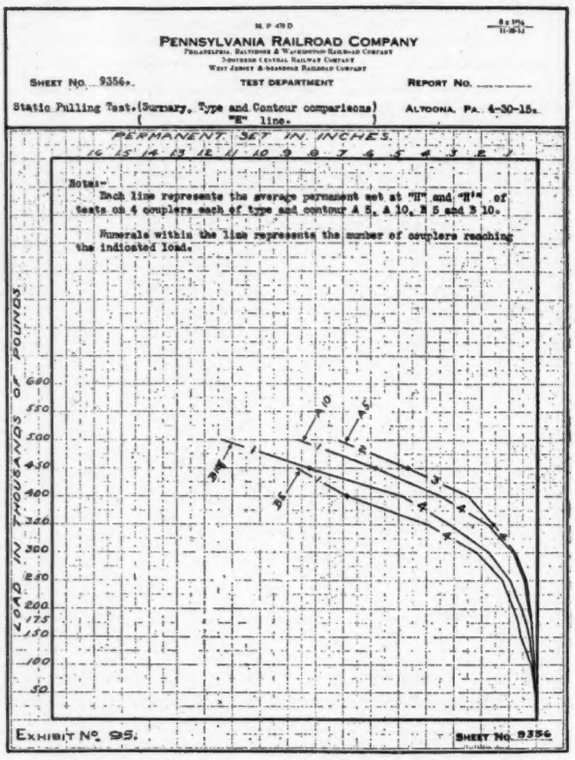


Fig. 12.—Set of *H* Line in Static Pulling Test

Alliance, Ohio, certain slight modifications in the details of the couplers were found desirable. The changes on the couplers were made by the respective manufacturers, and

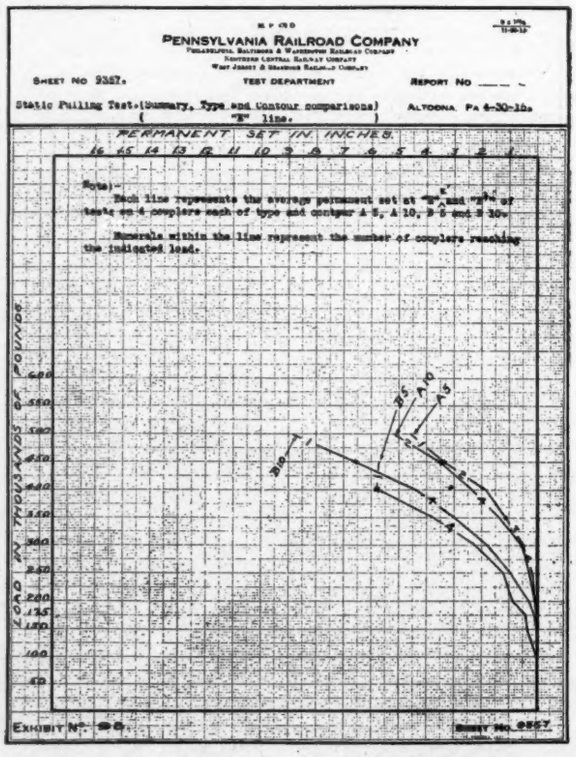


Fig. 13.—Set of *E* Line in Static Pulling Test

couplers embodying the modifications were tested on the same machine. Both types of couplers with the No. 5 contour lines were separately subjected to 30,000 cycles of the

machine, every cycle representing one each of the following operations, namely: Coupling, lock-setting, uncoupling, closing knuckle and throwing knuckle open. After completion of

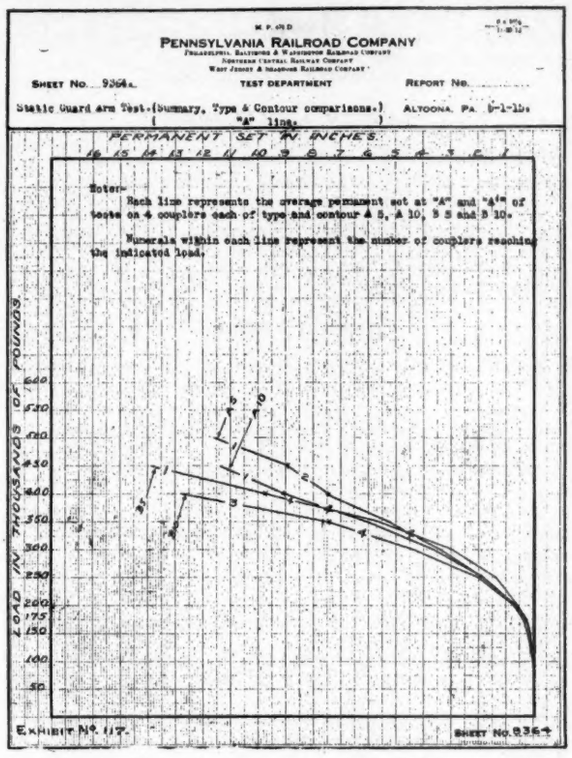


Fig. 14.—Set of *A* Line in Static Guard Arm Test

tests both types of couplers were in good operating condition, and, while during the test some minor defects of operation were noted, it was clearly established that the modifica-

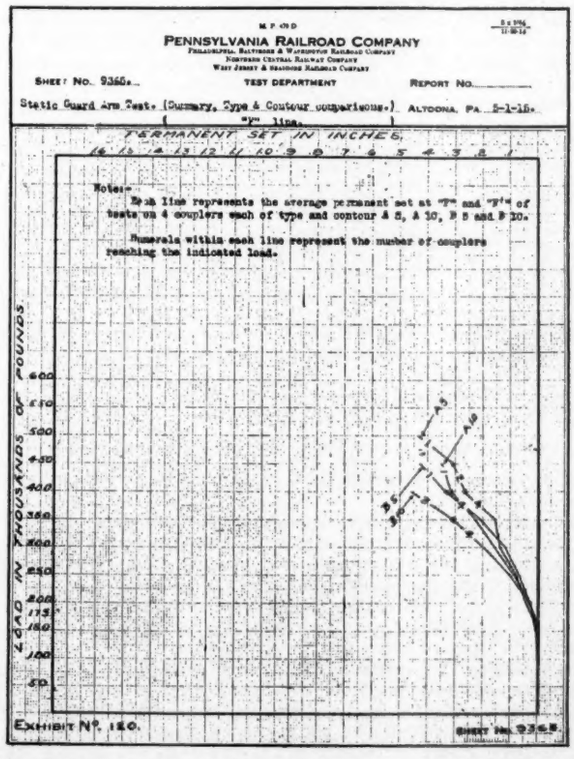


Fig. 15.—Set of *F* Line in Static Guard Arm Test

tions which had been made, as the results of the former tests, were beneficial to the extent of correcting most of the trouble previously experienced.

WEIGHT OF TYPES "A" AND "B" COUPLERS

The opinion has been voiced, although no specific objection has been made, that the weight of the Experimental Standard M. C. B. couplers is too great; and this subject has been seriously considered by the committee, as well as jointly between the committee and the coupler manufacturers, and from what can be learned, the objections that have been raised are commercial, based on the increased cost due to the increased weight, rather than any definite mechanical objection to the increased strength or weight. The breakage in the Experimental Standard M. C. B. couplers in service demonstrates conclusively that the strength of the coupler is not abnormal, and the tests prove that there is a maximum strength per pound of weight employed in the designs.

NEW EQUIPMENT TO BE DESIGNED TO ACCOMMODATE THE STANDARD COUPLER

The committee deems it advisable to call to the attention of the members the desirability of designing any new equipment—locomotives or cars—to accommodate the standard coupler. It has been found that a 6 in. by 8 in. shank is essential on the standard coupler, and, therefore, provision should be made for the same in all new or redesigned equipment, so that the standard coupler can be applied in repairs when finally adopted. In so far as locomotives and tenders

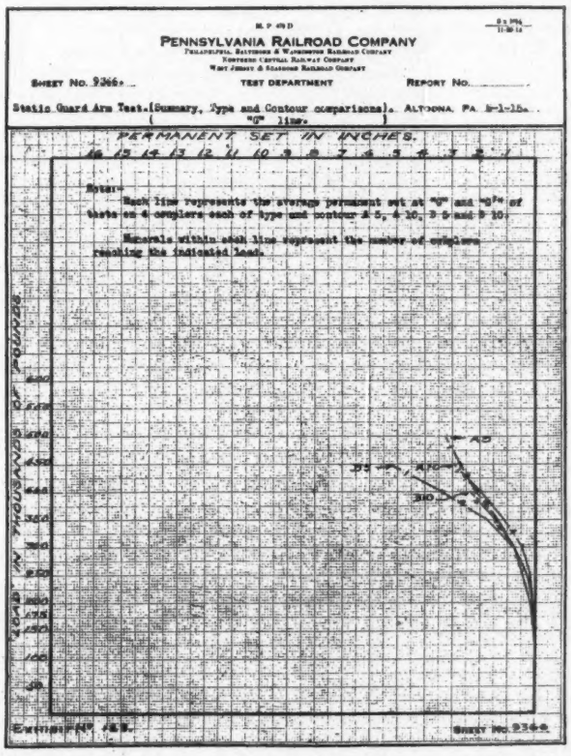


Fig. 16.—Set of *G* Line in Static Guard Arm Test

are concerned, it is economical to immediately apply the present Experimental Standard M. C. B. couplers, inasmuch as they are not interchanged, and obtain the saving resulting from the increased life of these couplers.

The report is signed by:—R. L. Kleine (Penna.), chairman; G. W. Wildin (N. Y., N. H. & H.); F. W. Brazier (N. Y. C.); F. H. Stark (Montour); J. F. De Voy (C., M. & St. P.); B. Julien (U. P.), and J. W. Small (S. A. L.).

DISCUSSION

F. W. Brazier (N. Y. C.): I cannot let this opportunity go by, although I am a member of the committee, without telling you gentlemen of the immense amount of work which has been done in getting up this report through the efforts of Mr. Wallis and Mr. Kleine, and the debt we owe to the Pennsylvania Railroad Company for the work it has undertaken in this direction. It is sometimes asked why the coupler should weigh approximately 400 lb. The committee would like to get it down to 100 lb. but in order to get strength you must have weight. Although these couplers will cost more, with the heavy engines now in use, and with the increased weight of equipment generally, it is necessary we should plan to put in new couplers, and I

of steel hopper cars loaded with coal, and brakes set on a number of the latter. The train of 50 N. & W. cars upon which the investigation was being conducted was then thoroughly stretched with a locomotive and brakes set on locomotive and several cars next to it, to insure the stretching. Each coupler was centrally punched on top of the head just back of the face and on the longitudinal center line of coupler and the distance trammed. The train was then bunched and the distance between the center-punched marks of each coupling above referred to was again trammed, the difference between this distance and the original distance as laid off with cars stretched being the slack per coupling. These cars and couplers had an average service of a little over nine months at time of these measurements.

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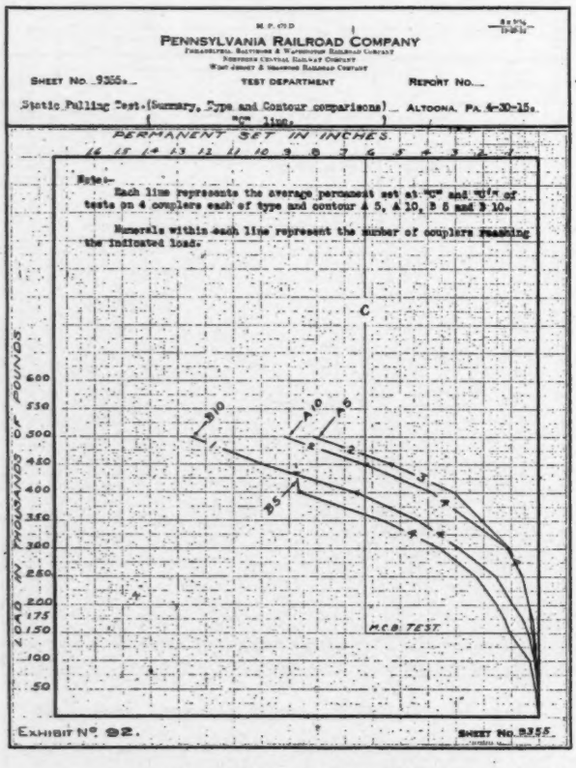

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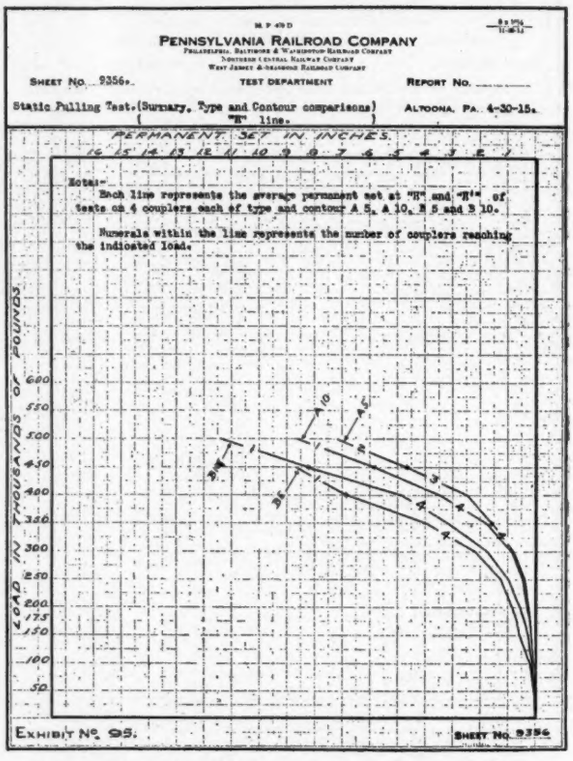


Fig. 12.—Set of *H* Line in Static Pulling Test

Alliance, Ohio, certain slight modifications in the details of the couplers were found desirable. The changes on the couplers were made by the respective manufacturers, and

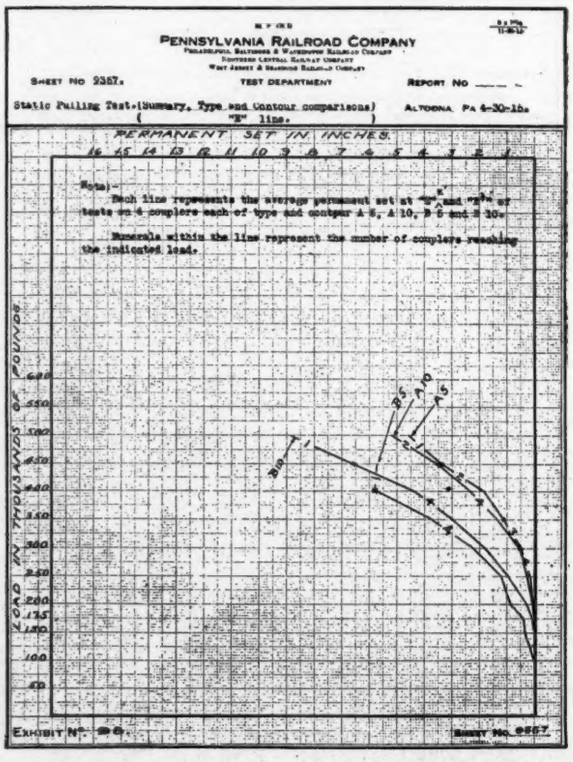


Fig. 13.—Set of *E* Line in Static Pulling Test

couplers embodying the modifications were tested on the same machine. Both types of couplers with the No. 5 contour lines were separately subjected to 30,000 cycles of the

machine, every cycle representing one each of the following operations, namely: Coupling, lock-setting, uncoupling, closing knuckle and throwing knuckle open. After completion of

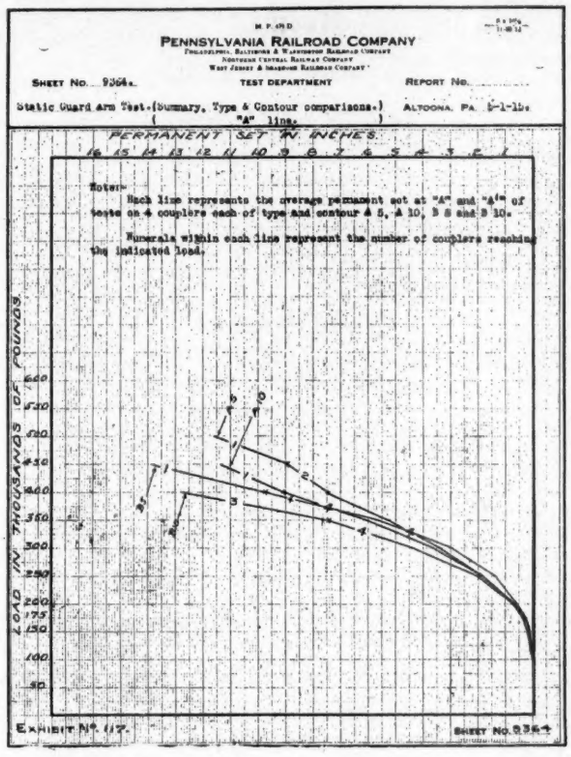


Fig. 14.—Set of *A* Line in Static Guard Arm Test

tests both types of couplers were in good operating condition, and, while during the test some minor defects of operation were noted, it was clearly established that the modifica-

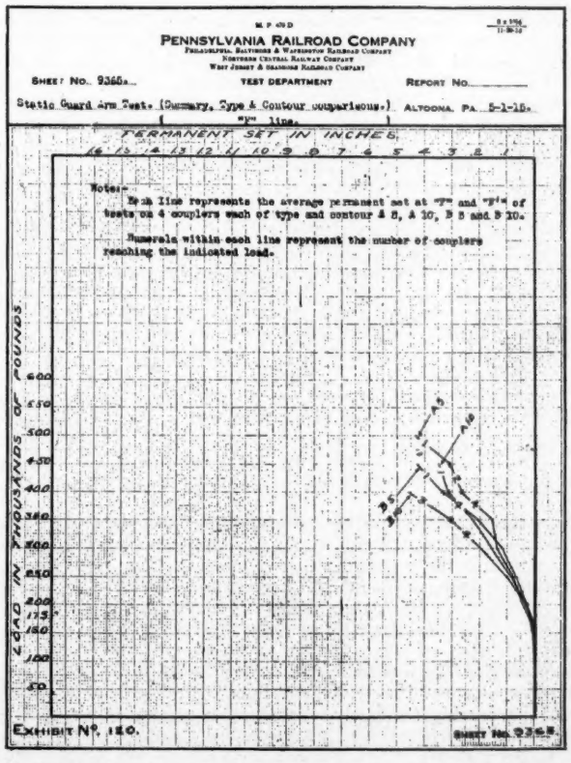


Fig. 15.—Set of *F* Line in Static Guard Arm Test

tions which had been made, as the results of the former tests, were beneficial to the extent of correcting most of the trouble previously experienced.

WEIGHT OF TYPES "A" AND "B" COUPLERS

The opinion has been voiced, although no specific objection has been made, that the weight of the Experimental Standard M. C. B. couplers is too great; and this subject has been seriously considered by the committee, as well as jointly between the committee and the coupler manufacturers, and from what can be learned, the objections that have been raised are commercial, based on the increased cost due to the increased weight, rather than any definite mechanical objection to the increased strength or weight. The breakage in the Experimental Standard M. C. B. couplers in service demonstrates conclusively that the strength of the coupler is not abnormal, and the tests prove that there is a maximum strength per pound of weight employed in the designs.

NEW EQUIPMENT TO BE DESIGNED TO ACCOMMODATE THE STANDARD COUPLER

The committee deems it advisable to call to the attention of the members the desirability of designing any new equipment—locomotives or cars—to accommodate the standard coupler. It has been found that a 6 in. by 8 in. shank is essential on the standard coupler, and, therefore, provision should be made for the same in all new or redesigned equipment, so that the standard coupler can be applied in repairs when finally adopted. In so far as locomotives and tenders

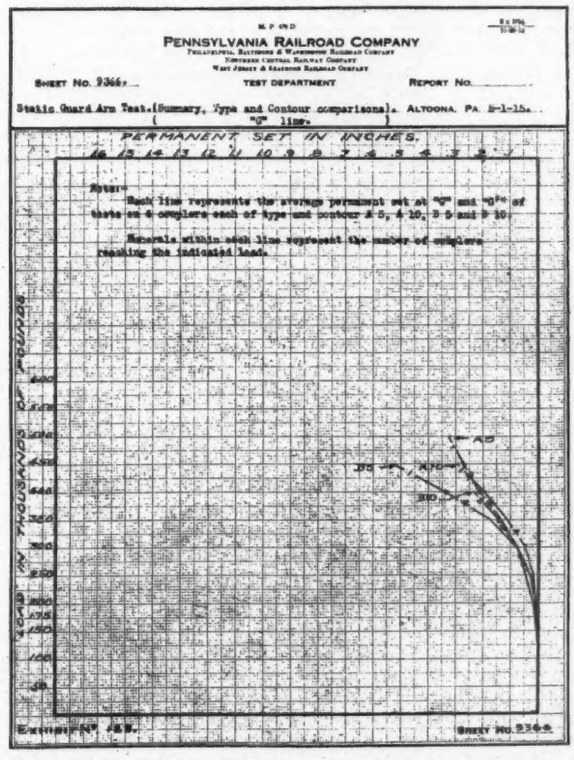


Fig. 16.—Set of *G* Line in Static Guard Arm Test

are concerned, it is economical to immediately apply the present Experimental Standard M. C. B. couplers, inasmuch as they are not interchanged, and obtain the saving resulting from the increased life of these couplers.

The report is signed by:—R. L. Kleine (Penna.), chairman; G. W. Wildin (N. Y., N. H. & H.); F. W. Brazier (N. Y. C.); F. H. Stark (Montour); J. F. De Voy (C., M. & St. P.); B. Julien (U. P.), and J. W. Small (S. A. L.).

DISCUSSION

F. W. Brazier (N. Y. C.): I cannot let this opportunity go by, although I am a member of the committee, without telling you gentlemen of the immense amount of work which has been done in getting up this report through the efforts of Mr. Wallis and Mr. Kleine, and the debt we owe to the Pennsylvania Railroad Company for the work it has undertaken in this direction. It is sometimes asked why the coupler should weigh approximately 400 lb. The committee would like to get it down to 100 lb. but in order to get strength you must have weight. Although these couplers will cost more, with the heavy engines now in use, and with the increased weight of equipment generally, it is necessary we should plan to put in new couplers, and I

hope to live long enough to see the railroads of this country agree on one standard form of coupler.

D. R. MacBain (N. Y. C.): I move that the convention extend to Mr. Kleine and his committee the thanks of the Association.

(The motion was carried.)

R. L. Kleine (Chairman): I thank you, gentlemen. I might say that the coupler manufacturers have worked equally hard with this committee in endeavoring to bring about one standard coupler.

The President: The privilege of the floor is extended to such representatives of the coupler manufacturers who may desire to speak.

R. E. Janney (Am. Steel Fdries): I would like to say that the coupler manufacturers have as much to thank your committee for, and probably more, than they have to thank us for.

S. P. Bush (Buckeye Steel Castings Co.): The coupler manufacturers are very much interested in this question. We are particularly interested in seeing the best coupler that can possibly be devised adopted as a standard. The question of weight is a very important consideration. In coming in contact with railroad representatives in different parts of the country we find that certain railroads feel that they do not need such a heavy coupler, and doubtless for their own local conditions that may be true. But a coupler has got to be considered in the light of the interchange service, and the future certainly must be considered in the matter. It is not unlikely that the average service of the next ten years is going to be increased in severity, so that if there are any objections to a coupler of the weight that has been suggested it would seem that the reasons ought to be fully set forth. From a manufacturer's standpoint we feel that as long as the association undertakes to adopt a standard it would be decidedly advantageous to have a single standard.

S. L. Smith (Nat'l Mall. Castings Co.): The committee seems to be very unanimous in its opinions, and I think they have found that the coupler manufacturers were willing to go along with them. When you get a standard coupler, it will be the result of the joint efforts of the Coupler Committee, and the majority at least. of the coupler manufacturers.

E. M. Grove (McConway & Torley): A number of years ago when the 100,000 lb. cars were first advocated, the small coupler was the standard all over the country. They were placed on these cars and in an air-brake test they went to pieces. Today the same conditions prevail with the larger cars, the larger locomotives, and the larger trains. We have got to meet the marked progress. You cannot buy 400 lb. of material at the same price that you can buy 300 lb. of material. I believe that in getting the additional strength, the additional weight, that the railways will be well repaid by the increased amount of service that they will get out of the couplers.

G. W. Wildin (N. Y., N. H. & H.): I move that it is the sense of this convention that the strength of the coupler and its resultant weight as presented by the Coupler Committee is necessary to provide for the proper strength and service in interchange.

M. K. Barnum (B. & O.): I second Mr. Wildin's motion. The B. & O. finds that the present coupler is not equal to requirements.

A. R. Ayers (N. Y. C.): In case of the heavy couplers being unsatisfactory to apply to existing cars, and in case the large coupler is adopted, what provision could be made in the way of adopting a shank on the proposed coupler that would fix existing cars, and in case you do use a small shank will it be an overbalanced coupler.

Mr. Kleine: The committee has recommended two shanks, the 5 in. by 7 in. shank for existing cars and the 6 in. by 8 in. shank for new cars. The 5 in. by 7 in. shank is just a little too weak for the head, but it is giving us very satisfactory service. We have asked, in new cars and in re-designing the present equipment, that room be left in the end sill for the 6 in. by 8 in. shank.

William Schlafge (Erie): We have equipped 200 cars with the couplers recommended by the Association. It was necessary to use the 5 in. by 7 in. shank, and so far we have not experienced any trouble whatever.

Mr. Janney: In regard to the weight, there is a limit beyond which the coupler cannot go, limiting dimensions having been placed upon the size of the head. It is not such a great increase, when you consider after this you have reached the limit. (Mr. Wildin's motion was put and carried.)

The discussion was closed.

D. R. MacBain, (N. Y. C.): I move that the incoming Executive Committee shall take as a text for its work during the next year the address of the president to this convention. I am sure that we have never had anything more directly in line with the cause we are pursuing than President Crawford's address delivered at the opening of this convention, and if this association, through its Executive Committee, will profit by the suggestions made by President Crawford, I feel that a great deal of good will result.

(The motion was seconded and carried.)

SAFETY APPLIANCES

The President: The next business is the report of the Committee on Safety Appliances. As chairman of the committee I beg to report to you that during the year which has elapsed nothing has come up which has warranted the holding of a meeting of the committee, and I therefore have nothing to report on this subject.

The report was accepted.

LOADING RULES

The committee calls special attention to the suggested addition to Rule 120, covering the loading of large blocks of stone. It spent considerable time with the stone shippers, in an endeavor to determine the best method of securing such stone containing 100 cu. ft. and upward, known as "mill block." A number of tests were made by dropping cars loaded with such stone against a draft of cars, the speed of the impact ranging from 3 to 6 m. p. h. It was shown that at a speed of about 4 m. p. h. the stone actually moved, although protected by standard end stakes. The committee, with the railroad representives present, have been convinced that the value of the present form of stake under such condition is limited.

In order to prove the value of cleating against side creeping, Mr. May, superintendent motive power of the Chicago, Indianapolis & Louisville, with representives from the stone quarries, made some observations in train service between Bloomington and Lafayette, Ind. Seventeen cars loaded with mill block were selected and accurate measurements were taken en route. It was conclusively shown that the stone did creep, both side and end wise. The committee is not unanimous in its approval of the suggested paragraph, there being one dissenting vote.

The committee recommends the following changes in the present M. C. B. Loading Rules:

Rule 12-*C*.—After the word "pockets," in the third line, change the rule to read, "by driving wedges in from the top of the pocket and securely nailing them to the stake."

Rule 15-*A*.—Has been changed to read as follows: "For loads carried on one bearing piece per car (with or without sliding pieces), located at or near center of car, the weight of lading must not exceed two-thirds the capacity of car carried on flat or low-side gondola cars of all-steel or steel underframe construction, or on flat or low-side gondola cars of wooden construction having more than two truss rods. On steel flat and steel drop-end gondola cars, constructed with fish-belly girders, the weight of the lading must not exceed three-quarters of the capacity of car."

Rule 15-*B*.—Has been changed to read as follows: "For loads carried on one bearing piece per car (with or without sliding pieces), located about equal distance from center of car and center of truck, the weight of lading must not exceed three-quarters of the capacity when carried on cars of all-steel or steel underframe construction, or on flat or low-side gondola cars of wooden construction having more than two truss rods."

Rule 15-*F*.—Omit.

Fig. 5.—Eliminate note reading as follows: "For logs, piling, props and telegraph poles, use 10 strands or 5 wrappings, Rule 57."

Rule 93.—After the word "iron" in sixth line insert "¼ in. by 6 in. for loads of 40,000 lb. or less, and ½ in. by 6 in. for loads over 40,000 lb."

Rule 98.—The last sentence should be changed to read as follows: "Rolling freight must be loaded longitudinally with car, and must be substantially chocked with side blocking in height equal to one-seventh (1/7) the diameter of rolls, provided that blocking of more than ten (10) in. in height will not be required. End blocking to be not less than four (4) in. in height."

Rule 98-*B*.—The committee would recommend the incorporation of a new rule 98-B, as follows: "Loose wheels and tires should preferably be loaded in gondola cars that do not have drop doors. Such material should not be loaded in gondola cars having drop doors in steel floors larger than the lading. When such material is loaded in gondola cars having doors in wooden floors larger than the lading, the entire door opening must be properly protected with boards of sufficient strength, securely nailed to the floor of the car to prevent shifting."

Rule 117-*C*., *Fig.* 61-*E*.—Should be inserted in the Code, also

added to Rule 117-C. This cut shows another manner of loading mining cars. (See Fig. 1).

Rule 120.—As a second paragraph of Rule 120 add the following:

"Mill block containing as much as 100 cu. ft., resting on channel or gabled surface not less than 25 sq. ft. or proportional for increased sizes must be so loaded that the weight of total lading will be uniformly distributed over the floor of the car, resting on a layer of sand, cinders or crushed stone, covering the entire bearing surface of the stone.

"Gondola cars are preferable for such shipments, but if flat cars are used, the lading must be placed at least 18 in. back of the end of the car. Each block of stone loaded lengthwise,

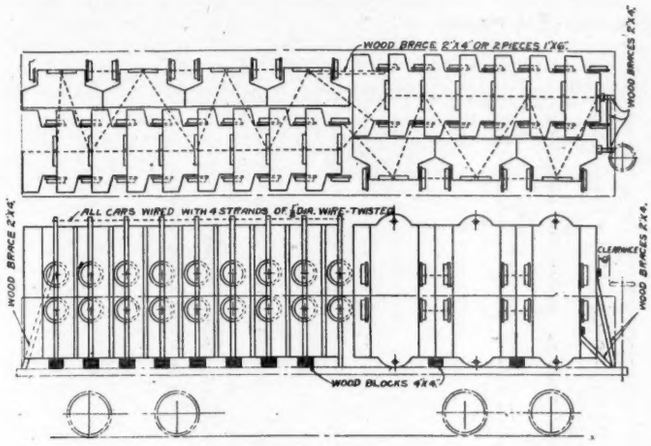


Fig. 1.—Manner of Loading Mining Cars in Gondola Cars

crosswise or obliquely must be protected against creeping by side and end cleats, securely nailed to the floor of the car with forty-penny nails. (When two blocks of stone are loaded parallel and close to each other, or wedged apart, they will be considered as one stone as to cleating.)

"If stone is placed lengthwise of the car and is 4 in. or closer to the side of the car, two standard side stakes 6 in. in height must be placed opposite such stone in lieu of cleats, on that side of the stone. Stone must not be loaded obliquely when it is possible to load it lengthwise or crosswise of the car.

"Cleats must consist of not less than 2 in. by 4 in. sound, straight-grained lumber, and extend at least three-quarters of the length or width of stone.

"If the 2-in. cleat does not have a full 1-in. vertical bearing

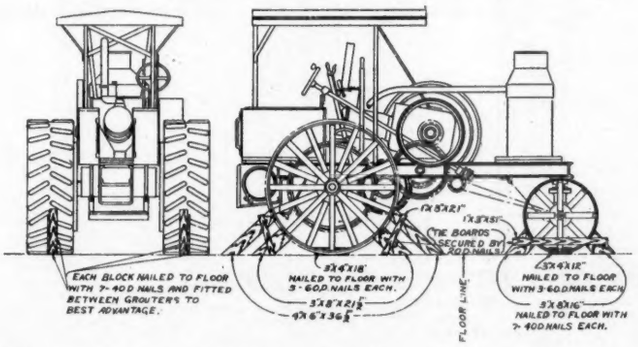


Fig. 2.—Manner of Loading Gasoline Tractor Engines on Flat Cars

for its full length against the edge of the stone, cleats may be built up to the requisite height, retaining the specific width."

Rule 121-*B*.—Add a new sentence to the end of the rule reading as follows: "Shipments of gasoline traction engines should be secured as per Fig. 64-G or 64-H." (See Fig. 2.)

Rule 124.—Should be changed to read as follows:

"Lading must be secured in closed cars so that it will not come in contact with side doors or roll or shift in transit, and must be so placed in car that there will not be more weight on one side of the car than the other.

"Lading of a character requiring protection to prevent it falling or rolling out at doorway, or coming in contact with door while in transit, must have the prescribed stripping across the door opening.

"Door strips must be nailed to the inside of door posts (never on the outside), and must not be less than 1 in. thick by 5 in. wide, straight-grained sound lumber, or their equivalent; or slab wood not less than 1½ in. thick at center; spaced sufficiently close to floor of car and to each other to prevent the lading from falling or rolling out of car or coming in contact with the door.

"When necessary to nail cleats or braces to lining of box cars having steel superstructure without exterior siding, the nails must not be driven entirely through the lining."

Rule 124-*A*.—Change to read: "Brick 15 in. or less in length loaded crosswise at doorway do not require door protection if built up as per Fig. 68-B, (See Fig. 3) and packed tight to prevent motion between bricks. Brick of any length loaded lengthwise at doorway must have door protection as per Fig. 68-C. Such brick should also be packed tight to prevent motion between each other."

Rule 126.—Should be changed to read as follows: "Barrel staves, fence posts, wooden billets, lath, tan bark and similar short wood should be loaded in accordance with Figs. 68 or 68-A. If the pieces are tapered, they must be loaded with tops and butts alternating. The material must be loaded longitudinally with car, except at door openings, where it must be placed crosswise. If loaded in accordance with Fig. 68, the doorway must be protected with strips extending across door opening, securely nailed on the inside of door posts. For the size of strips and manner of stripping doorway see Rule 124.

"If loaded in accordance with Fig. 68-A, the outer ends of staves or similar short material, whatever it may be, but of a length permitting two piles to be loaded end to end in doorway and still be at least 10 in. inside or door line, must rest on pieces

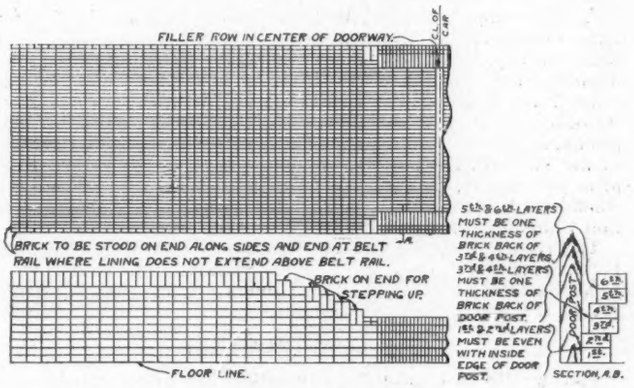


Fig. 3.—Manner of Loading Brick 15 inches or Less in Length Without Door Protection

not less than 4 in. thick and lengthwise of door openings, in order to make the pile incline toward center of car. This method makes the stripping of door opening unnecessary."

Rule 130.—Omit.

The report is signed by:—A. Kearney (N. & W.), chairman; L. H. Turner (P. & L. E.); J. M. Barrowdale (I. C.); G. H. Gilman (N. P.); Chas. N. Swanson (A. T. & S. F.); A. B. Corinth (A. C. L.), and R. L. Kleine (Penn.).

DISCUSSION

F. W. Brazier (N. Y. C.): Regarding the recommendation made with reference to changing Rule 124. We all know that we have a great deal of trouble with freight coming in contact with the doors under load. There is no way that any inspector can know or see what the condition of the lading is in a car that is sealed up. It is a traffic matter, and when we get home we should go to our managers and to our agents and see that they know the cars are loaded right. The thing is this: Will they live up to the rules? The rules are all right. It is a matter that the traffic department should be severely censured on. Under Rule 120 it says: "Cleats must consist of not less than 2 in. by 4 in." I hope there will not be any microscopic inspectors who will hold up a car because the cleats are 1⅞ in. by 3⅞ in. I would say that it should read "about 2 in. by 4 in." The doors on the equipment throughout the country are much improved, but there is still a good chance for those who are maintaining equipment to pay more attention to the door brackets, fastenings and to the hangers.

(It was voted that the recommendations of the committee be submitted to letter ballot.)

OVERHEAD INSPECTION OF BOX CARS

The committee explained in its last report that the result of its work had been turned over to the Committee on Relations between Railroads of the American Railway Association, with the advice that it was ready and desired to assist in any way their committee thought the work might be further pursued.

Few additional roads have done very much toward even trying out the proposed certificate of inspection card, although it was recommended by the American Railway Association. Those that are experimenting have found difficulty, it is reported, and quite naturally, on account of so few roads having taken up the proposed inspection. It may be unfortunate it has not received wider attention, if for nothing else than to ascertain its value or determine what, if any, alterations and modifications might be effected to make it more suitable, and possibly better accomplish the desired end, or possibly permit the working out of some entirely different direction for higher general efficiency. The Committee on Relations between Railroads of the American Railway Association will again urge that the card be given a trial.

The report is signed by:—A. Kearney (N. & W.), chairman; L. H. Turner (P. & L. E.); C. N. Swanson (A. T. & S. F.); J. M. Barrowdale (I. C.); G. H. Gilman (N. P.); A. B. Corinth (A. C. L.), and R. L. Kleine (Penn.).

DISCUSSION

C. N. Swanson (A., T. & S. F.): This is one of the most important subjects to come before this convention. You heard yesterday of the millions of dollars being paid out for loss and damage to freight. I believe that more attention should be paid to our house cars, on the initial loading line. We are in hopes that some action will be taken by the organizations higher up, insisting that more money be spent on our box cars to stop this unnecessary draining of our treasury.

INTERLINE LOADING.

As this subject reached this association through the Conference Committee of the American Railway Association, it has been concluded, after consultation with the latter committee, that doubtless the energies of the M. C. B. committee might be best utilized by assisting the committee of the American Railway Association. It was considered such a course would be most profitable, besides would be helpful toward a better understanding of the M. C. B. loading rules requirements, which have for their principle mainly the safe carriage of shipments; secondly, it should tend to harmonize related rules reached by the Classification Committee in the formulation of their schedules.

The report is signed by:—A. Kearney (N. & W.), chairman; L. H. Turner (P. & L. E.); C. N. Swanson (A. T. & S. F.); J. M. Barrowdale (I. C.); G. H. Gilman (N. P.); A. B. Corinth (A. C. L.), and R. L. Kleine (Penn.).

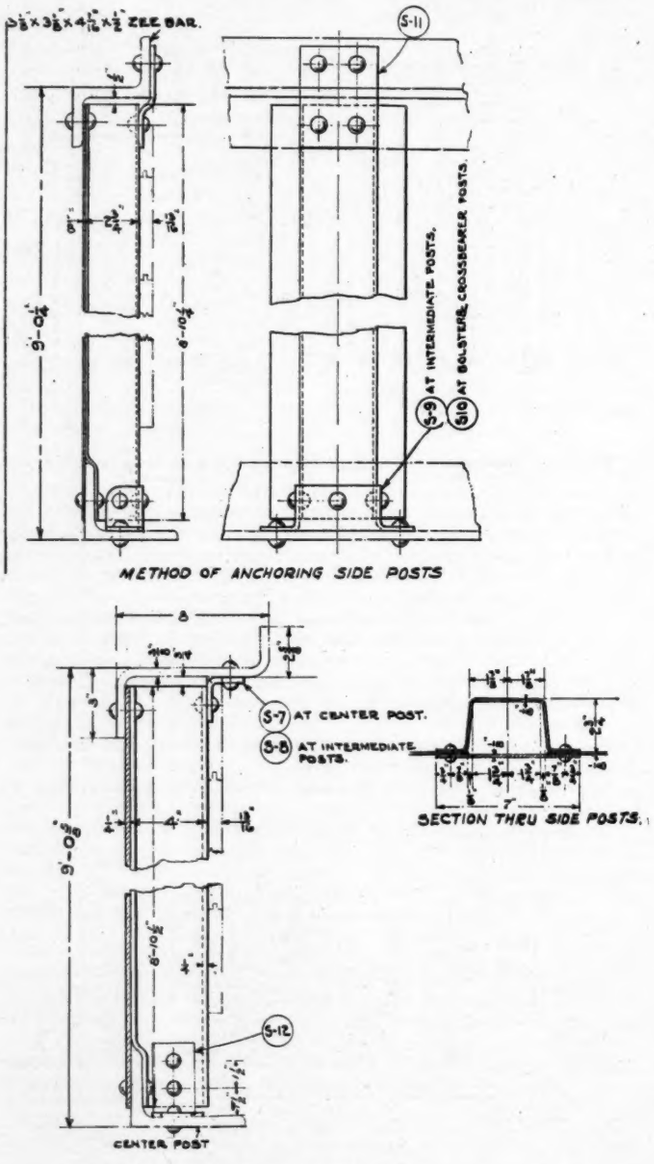
CAR CONSTRUCTION

During the past year the committee has given careful consideration to the various types of existing freight car designs, and has investigated current troubles and analyzed causes for such troubles. A large number of failures can be traced directly to weak center-sill construction and incorrect analyses of draft gear effect on center-sill construction. The committee

W. F. Kiesel, Jr.
Chairman, Committee on Car Construction

has, therefore, elaborated more than at first intended on the subject of draft attachments. In the following and in previous reports simple formulæ have been incorporated. The use of engineering formulæ to define fundamental requirements, without restricting types of design, is unavoidable. It must be understood that instructions governing specific designs or constructions may be based on these general formulæ by the engineering department of any road, without direct use of these formulæ, and which will be readily understood by those handling the interchange of cars.

At the 1914 convention your committee submitted a specification for box-car doors and fastenings, including a specification for reinforcing existing doors, a specification for complete new doors for existing cars, for new construction, and a revision of Sheet M. C. B. 30 embodying various improvements. The specification for complete new doors was referred to letter ballot and lost. The committee submits herewith another specification for box car doors, which is limited to new equipment



Method of Anchoring End and Side Posts

and which permits the use of top or bottom rollers, and which it is thought represents the minimum requirements that should be accepted for box car doors on new cars.

SPECIFICATION FOR BOX CAR OUTSIDE HUNG SIDE DOORS FOR NEW CARS

Doors may be either of wood or steel construction. If of wood construction, the wood frame and sheathing must be contained within a steel frame, riveted together at the corners and having at least one additional horizontal steel stiffener securely fastened at the ends to side members of steel frame.

Means must be provided for continuous weatherproofing and fireproofing around the top, bottom, front and back edges of the door when closed. The top of the door must be continuously supported against outward pressure, and this support must also form the weatherproofing.

Closed door stop must be of metal, preferably continuous from top to bottom of the door. If the continuous door stop does not support the door against outward pressure, such support must be provided by not less than two brackets with lips, equivalent to brackets shown on Sheet M. C. B. 30, and located as shown thereon.

Metal open door stops are recommended, one or more in number, equivalent in strength to the design shown on Revised Sheet M. C. B. 30, securely bolted to the belt rails or framing of the car with at least two ½-in. bolts or their equivalent. If wood open door stop is used, it should extend the entire height of the door and be reinforced by clip washers, or through bolts to prevent splitting.

The bottom of the door must be supported against outward pressure at not less than two points for any position of the door. If individual bottom door guides, fastened to the car body, are used, they must be as least four in number, one located adjacent to each door post, one in the middle of the doorway, and one between the back door post and the open door stop, approximately as shown on Revised Sheet M. C. B. 30, and similar in design, with particular reference to the height of the lip, which should be not less than 1¼ in.

If door hangers are fastened to the door with bolts, the design of the door fastenings must be such that with hangers broken or removed the door can not be removed from the car, except by removal of either the track, door guides, or door stops. When substantial hangers are riveted to steel doors, or to steel frames of wooden doors, with not less than four ⅜-in. rivets or their equivalent, this provision need not apply.

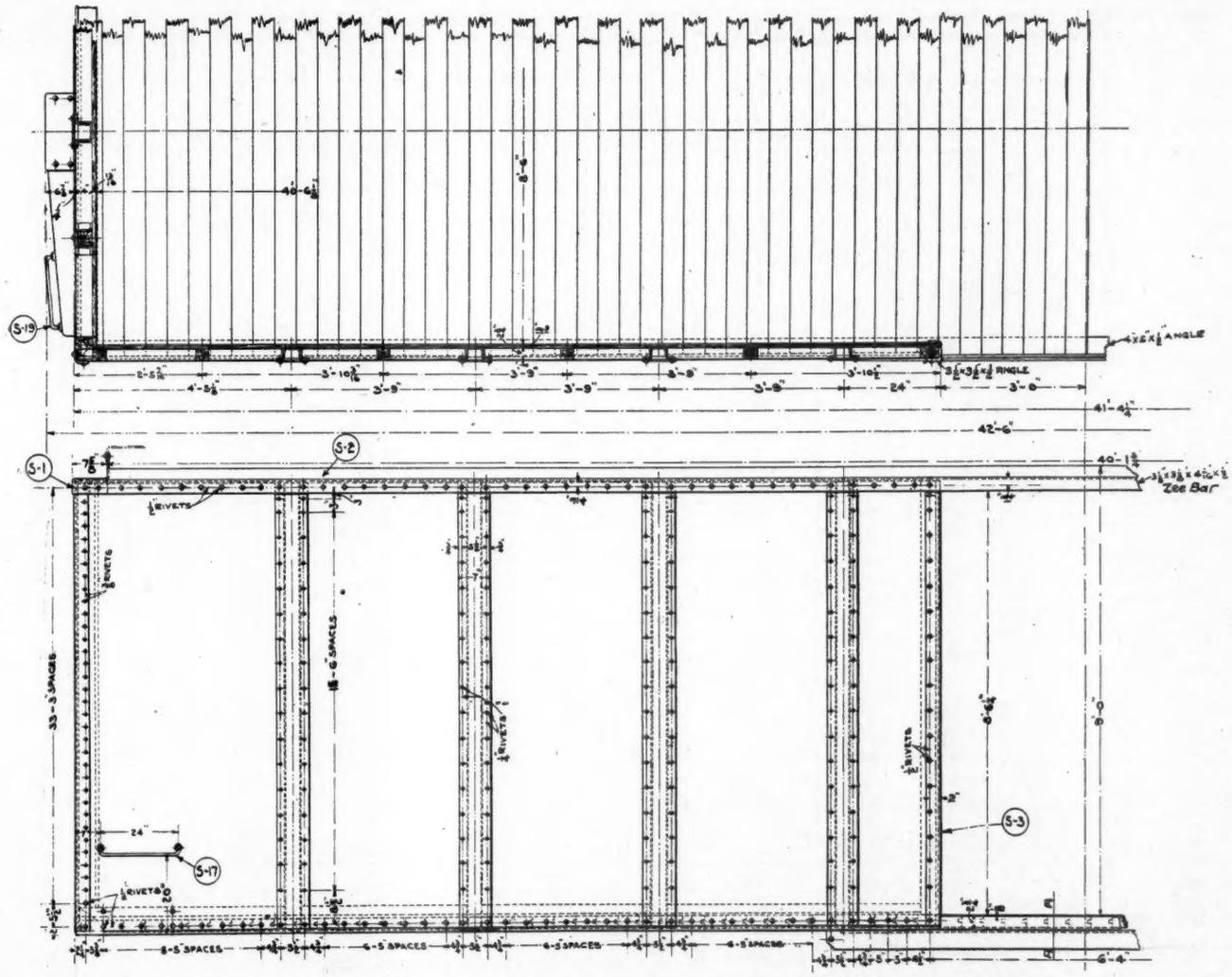
When hangers or rollers are fastened directly to the sheathing of wooden doors, bolts must be not less than ⅜ in. in diameter, at least four in number for each hanger, and spaced not less than 4 in. apart horizontally and 5 in. vertically, hangers to be preferably located so the bolts will pass through two or more boards.

The door track may be located either above or below the door opening and the door supported so that under any service conditions there will be no binding of the door from vertical interference with the door guides or track. The upper door track, if used, must be continuous in one piece, strong enough so that it will not sag, and securely fastened to the car; proper flashing, if necessary, to be provided over the door track. If the door is supported at the bottom, means for keeping the supports in alignment must be provided.

For wooden doors, the door-hasp fastener must be at least 24 in. long, fastened with not less than five ⅜-in. bolts, with nuts on the inside of the door. The door-hasp fastener must be of such design that the hasp can not be removed without removing the bolts from the fastener. The door-hasp fastener must be secured to the steel frame of the door by at least one bolt or rivet. For steel doors, the door-hasp fastener must be rivetd to the door.

Proper clearance must be provided so that ⅜ in. bulging of the side of the car will not interfere with the free movement of the door. Door mechanism must be so designed that in a closed position the door is drawn reasonably tight against the side of the car. It should be possible for one man to open or close the door readily from the ground without tools.

All of the above recommendations apply particularly to cars with 6 ft. door openings and single outside hung side doors, and in all cases where a particular construction is described, or specific dimensions are given, their equivalent will be acceptable.



Arrangement of Side and End Sheets, M. C. B. Standard Car

DRAFT GEAR

The report submitted in 1914 was rejected, and criticisms from various sources indicated that the restrictions recommended were considered insufficient to eliminate undesirable draft gears and to sufficiently reduce the excessive repairs now required for old equipment. In this report it has, therefore, been the object of the committee to formulate rules based on fundamental prin-

ciples and comparable with the strength of other parts of the car. This naturally involves reference to the center-sill construction. Many roads are at present modifying wooden cars, which make it desirable to have a guide for minimum strength requirements for reinforcement of existing wooden cars to fit them for some years further service. For such cars the following rules are submitted:

The draft attachments, including draft arms—if used, must be of metal, of either integral or riveted construction.

The strength value of the draft attachments and center-sill construction must be equivalent to at least 10 sq. in. of steel in tension and compression, 6¼ sq. in. of rivet-bearing area, and 12½ sq. in. in shear. The ratio of unit stress to end load must not exceed 0.15.

Metal draft arms applied to wooden center sills must extend at least 30 in. beyond the center line of the bolster, toward the center of the car, must be securely fastened to the bolster and the center sills, and where possible should butt against the compression members placed between the draft arms and needle beams and also between the needle beams. Hardwood or yellow pine center sills may be considered equivalent to steel in center-sill construction between bolsters if they have four times the specified unit values, namely, 40 sq. in. tension and compression area, and a ratio of unit stress to end load not exceeding 0.0375. Where wooden members are reinforced with metal (composite construction) either the steel or the wood must alone meet the strength requirements. Where the horn of the coupler is allowed to come in contact with the end sill, the latter must be provided with a striking plate of sufficient strength to resist its proportionate load without deformation.

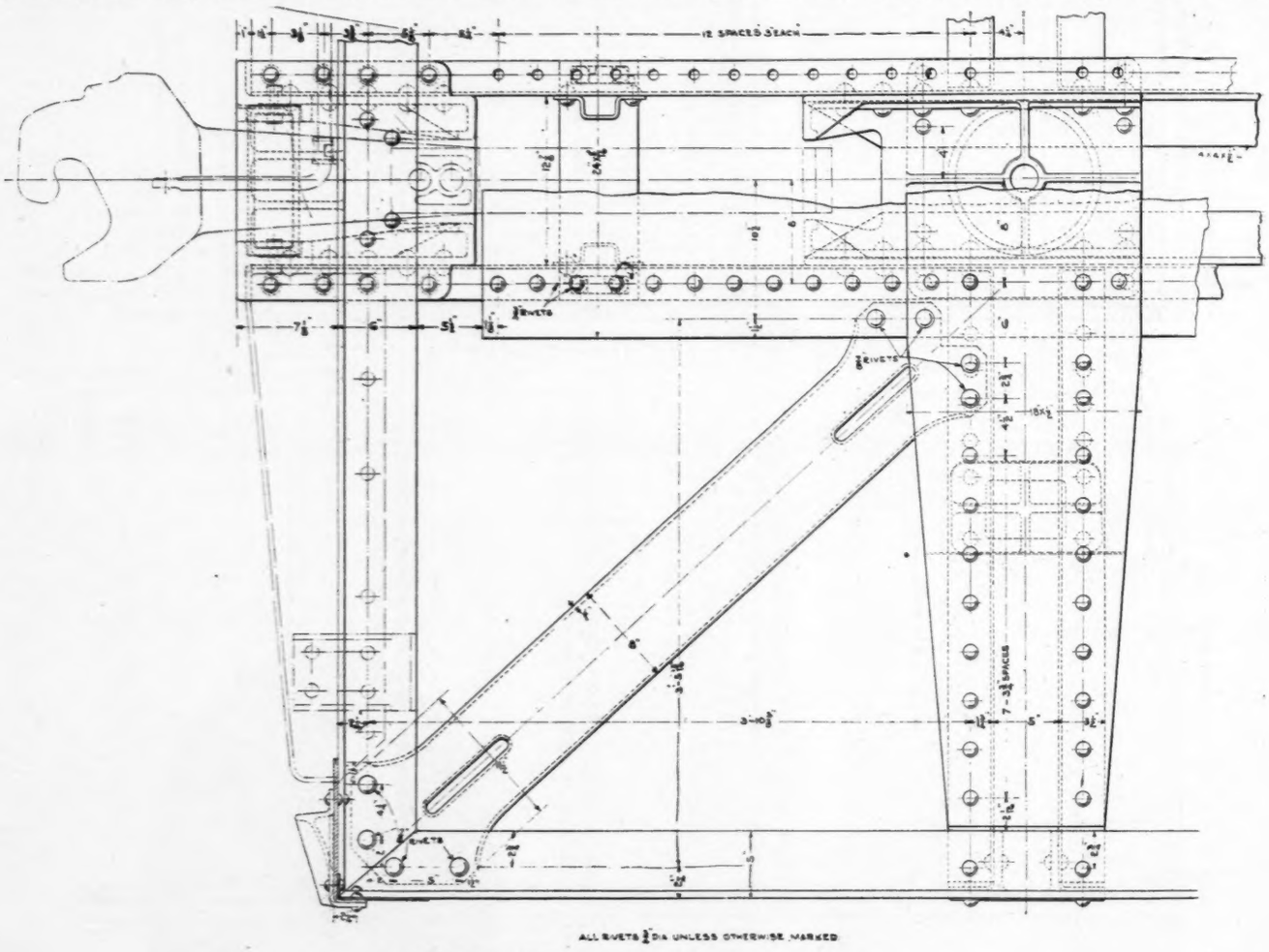
The intensity of end force is assured to be equivalent to 250,000 lb. static, which may be concentrated on the center line of the draft gear or distributed between the draft gear and end sill. The point of contact between the horn of the coupler and the striking plate is assumed to be 2 in. above the top of the coupler shank. For a shank 5 in. deep the distance from the center line of the draft gear to the assumed point of contact of the coupler horn is 4½ in. The proportion of end force acting on the striking plate is assumed to be 250,000 lb. less R, which is the resistance of the draft gear when the horn of the coupler touches the striking plate. Hence, when the coupler shank is 5 in. deep, and the horn of the coupler is allowed to touch the striking plate before the draft gear is solid, the end force of 250,000 lb. is effective on a line located a distance Y above the center line of draft gear,

$$Y = 4.5\left(1 - \frac{R}{250{,}000}\right)$$

It should be clearly understood that these rules are not intended to modify the recommendations made by this committee under heading "1a" for minimum strength of existing steel and steel underframe cars, and which were referred to the Arbitration Committee in 1914. Many existing wooden cars can be reinforced to come within "1a" requirements at little more expense than that necessary under the rules given above.

DESIGN OF A STANDARD M. C. B. BOX CAR

The committee submits a tentative design of a box car with the request that each member interested study it and send to the committee, before December 1, 1915, a letter—accompanied by sketches or drawings where necessary—giving recommendations for modifications; also expressions of preference of other details that can be used, or approval of materials and details shown in this design. The reason for the last request is to indicate to the committee whether the majority prefer the tentative design, or some change.



End Sill and Bolster; M. C. B. Standard Car

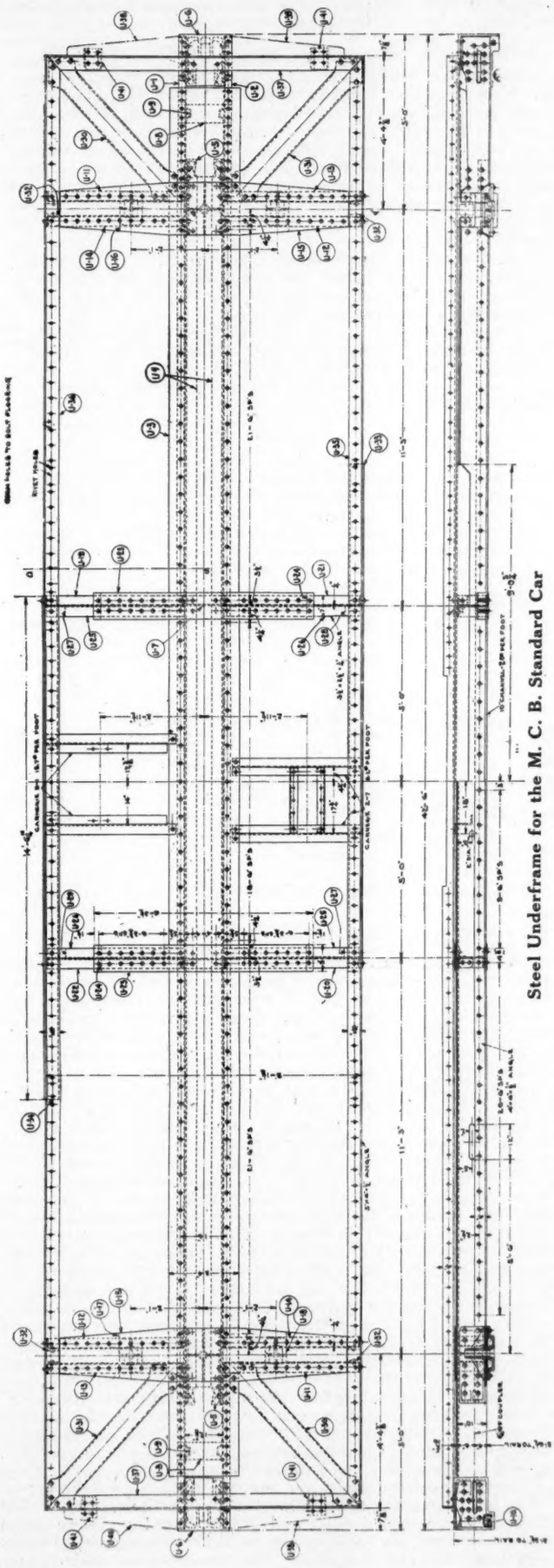
This tentative design is intended to cover the following:

Strength.—A small amount above the minimum requirements.

Weight and Cost.—The least that can be obtained per unit of strength.

Flexibility of Design.—To permit substitution of stronger parts or patented details interchangeable with those shown.

Type.—The committee selected the steel-sheathed type box car because it avoids loss of lading on account of shrinkage or damage to single courses of wood, because the smooth exterior



Steel Underframe for the M. C. B. Standard Car

reduces wind resistance, and because it permits the elimination of diagonal braces.

Underframe.—All parts thought to be unnecessary have been eliminated. As the side and end angles are a part of the side and end frames, the underframe consists of the center sill construction, two bolsters and two cross-bearers The cross-bearers transfer the load from the center sills to side frame. The bolster cover plate must be not less than ⅜ in. thick for 30-ton cars; 7/16 in. thick for 40-ton cars; and ½ in. thick for 50-ton cars. Rule 1B, adopted as Recommended Practice in 1914, requires that the center-sill construction shall have at least 24 sq in. section area, that the ratio of stress to end load shall not exceed 0.26, and that the length of the center and of the draft sill members between the braces shall not exceed 20d.

An analysis of the ends of center-sill construction follows:

The design is for the use of gears which do not permit the horn of the coupler to strike the end casting, and concentrate all end compression force on rear followers, but other gears are also applicable.

AREA:

Cover plate .....24 in. by ⅜ in.	= 7.5	sq. in.
Two channels ..... 2 in. by 5.88 in.	= 11.76	sq. in.
Two angles ..... 2 in. by 3.75 in.	= 7.5	sq. in.
Total	26.76	sq. in.
Allowance for rivet holes in bending	1.3	
Net area for bending	25.46	sq. in.

NEUTRAL AXIS OF SECTION:

In this calculation the moments of areas are taken with reference to top line of cover plate.

Cover plate ..... 7.5 sq. in. by	in.	=	1.17
Two channels.....11.76 sq. in. by 5	in.	=	62.5
Two angles ..... 7.5 sq. in. by 9.13	in.	=	68.47
Total Moments.....			132.14

$$\frac{\text{Total Moments}}{\text{Total Area}} = \frac{132.14}{26.76} = 4.938$$

which is the distance from top of cover plate to neutral axis.

MOMENT OF INERTIA OF SECTION:

Top cover plate .....($bh^3 \div 12$)	=	.06
Top cover plate.....(Ah^2)	=	160.43
Two channels .....(I)	=	157.4
Two channels .....(Ah^2)	=	1.65
Two angles .....(I)	=	11.12
Two angles .....(Ah^2)	=	131.74
Total		462.40

SECTION MODULUS (SM):

For top fibers $SM = \frac{462.4}{4.94} = 93.6$

For bottom fibers $SM = \frac{462.4}{5.375} = 86.03$

These calculations determine that

A = 26.76 sq. in.
X = 1.375 in.
SM at top fibers = 93.6
SM at bottom fibers = 86.03

Substituting these values in the formula $\frac{1}{A} + \frac{X}{SM}$, the ratio of stress to end load, when all of the end load is concentrated on the center line of coupler, is 0.05335, or less than .06. Similar calculations show that to meet the requirements the resultant line of the end force must not be less than 3 7/16 in. from the bottom line of the channels, and not less than 2½ in. from top line of channels. The center line of draft gear, which is the lowest possible line of end force, is 4 in. above bottom line of center-sill channels, and, therefore, well within the limits.

The end force through the horn of the coupler striking end casting may be assumed to act on a line 2 in. above the top line of the coupler shank, or for a shank 5 in. deep, 4½ in. above the center line of the coupler, which, in this case, is 1½ in. below the top line of the center-sill channels. The committee bases calculations on a total end force of 250,000 lb. From limitations determined above, this whole force may act on a line 3½ in. above the coupler center line, which determines that for this design the draft gear resistance, when the horn strikes the end sill, must be at least 19,500 lb., leaving 230,500 lb. acting on end casting. This in turn requires an effective area of center-sill construction of 22 sq. in. between the end sill and the rear follower. The tentative design has an effective area of only 11.76 sq. in. in compression, and 10.56 sq. in. in tension, requiring a draft gear resistance of at least 122,500 lb. when horn of coupler strikes the end casting. If this resistance is less, the ends of the channels must be reinforced accordingly.

The distance between the rear followers is 35 ft. 3¾ in., or less than twenty times the width of cover plate, which is 40 ft. The greatest length of bottom center-sill flanges, between anchors, is 125½ in., or less than 20 in. by 6.74 in. = 138.8 in. The bottom

side angles are held in line by the floor boards, and the top side Z-bars are held in line by the roof. The minimum effective area of the center sills in tension is 10.56 sq. in., or 5.6 per cent. more than required by Rule No. 6. The draft attachments shown are of the type commonly used. Other attachments suitable for tandem or other gears can be readily substituted.

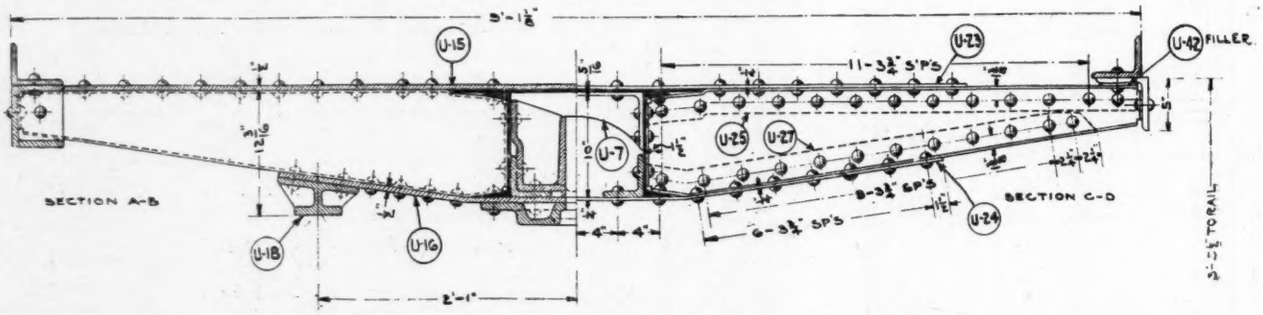
The flooring has been made 2⅜ in. thick, to avoid the use of intermediate sills. It is tongued and grooved, bolted to the center-sill cover plate and side angles, and all crevices, especially those between floor boards and side and end angles, are to be filled with melted bitumen, or other compound.

The brake arrangement shown differs from that now representing M. C. B. practice. This type has been selected because it does not vary the brake effect when cars pass around curves, and because the cylinder pressure acting on the live lever is counteracted by the strain on the dead lever, thus eliminating strain in the underframe braces. The old type brake can be readily substituted.

Side and End Framing.—The side sheets are ⅛ in. thick, and the side posts are U-shaped, uniform in section, except where offset for bottom angle, and do not necessarily require dies for their manufacture. The bottom angles and top Z-bars, forming lower and upper flanges, must be at least ⅜ in. thick for 30 tons, 7/16 in. for 40 ton, and ½ in. thick for 50 ton cars. The combined section modulus of all posts, on one side except corner posts, is 20.7.

The end sheets are ¼ in. thick, and the end posts are also U-shaped. The total section modulus of the end posts, not including corner posts, is 15.75. This covers requirements of rule in No. 2. The Z-shape of side and end plates permits ready application of any type of roof. If loose plate roofs are applied, the carlins should be a design that will brace the side plates both transversely and diagonally. Any type of carlin is satisfactory when solidly riveted roof is used.

Although the lining is shown for the full height of car, this may be partly or entirely eliminated. If the lining is entirely omitted the end posts should all have flangs riveted to the end sheet. The base of the door opening is flush and raised away from the side sheets of the car a distance of ⅜ in for 30 ton, 7/16 in. for 40 ton, and ½ in. for 50-ton cars.



Cross Section of Steel Underframe for the M. C. B. Standard Car

General Remarks.—The tentative box-car design submitted has the following general dimensions:

Length of frame over striking casting	42	ft. 6	in.
Width over sheathing	9	ft. 1⅜	in.
Length, inside	40	ft. 6⅛	in.
Width, inside	8	ft. 6	in.
Height, inside	9	ft.	
Height, from rail to bottom of bolster	2	ft. 6	in.
Height, from rail to floor	3	ft. 8½	in.
Height, from rail to top of running board	13	ft. 4½	in.
Height, from rail to top of brake staff	13	ft. 2	in.
Width, at eaves	9	ft. 2⅜	in.
Height, at eaves	12	ft. 5¾	in.
Side door opening			
Width	6	ft. 0	in.
Height	8	ft. 6¼	in.
Cubic volume under carlins	3096	cubic feet.	

The examples of box cars now passing over the roads in America illustrate that it will be of inestimable advantage, at least to the smaller railroads, who do not design their own cars, to have an M. C. B. design representing a standard of minimum strength required. Manufacturers of roofs, doors, draft gear and other specialties can reduce cost of manufacture, and can make more real progress in quality, if their various types of roofs, doors, etc., are interchangeable.

It will be noted that the end-sill design is such that it can be omitted, if desired, without affecting the integrity of the car. The permissible variations due to capacity are few. The bolster plates, side angles, Z-bars, and facing angles for door posts, may be ⅜ in. thick for 30-ton cars, 7/16 in. thick for 40-ton cars, and ½ in. thick for 50-ton cars. All other parts of the car body are governed by conditions which admit of no reduction in area or weight, for cars of less than 50-ton capacity.

SHEARING VALUES OF STRUCTURAL, RIVET AND MILD STEEL

Many experiments to determine the shearing values of steel have been made, and values of the ratio of shearing strength to tensile strength, varying between 65 per cent. and 85 per cent. have been recorded. Woehler's researches led him to establish a ratio of 80 per cent. This figure was later confirmed by Baushinger, for shearing strength, provided the shear is in a plane perpendicular to the direction of rolling. This figure has been generally adopted, and the committee recommends that, in all calculations for strength of parts, the following rule shall govern:

The allowable stress per square inch, for iron or steel subject to shear in a plane perpendicular to the direction of rolling, shall not exceed 80 per cent. of the allowable stress per sq. in. for tension, in the direction of rolling.

The report is signed by:—W. F. Keisel, Jr. (Penn.), chairman; A. R. Ayers (N. Y. C.); S. G. Thompson (P. & R.); C. E. Fuller (U. P.); E. G. Chenowith (C. R. I. & P.); J. C. Fritts, (D. L. & W.); T. M. Ramsdell (O-W. & Nav. Co.), and C. L. Meister (A. C. L.).

DISCUSSION

W. F. Keisel, Jr. (chairman): This week two communications were received which I think it would be well to read to the association. The committee has not taken action thereon, as we received one yesterday and one today.

[Both communications were received from the International Association of Railway Special Agents and Police—the following are abstracts from them.—Editor.]

The first communication contained the following:

"It has been established by a number of actual tests made by this association on cars of 30 different railroads, which had been in service from 2 to 8 years, and by experience gained in the investigation of a large number of claims and car robberies, that over 50 per cent of the box cars used in daily merchandise traffic can easily be entered without tampering with the seals, and without leaving any trace to indicate where or how robbery was committed.

"It was demonstrated that this condition is due to two faults in the construction of the car door. First the use of door brackets or guides 2 in. or less in height, which permit lifting the door over the rear bracket or guide with the aid of a small lever or brake shoe key so it can be pulled out sufficiently to allow the removal of packages of large dimensions. Second, the use of square head bolts in applying brackets, guides, rails and fastenings, on the outside of the door or car, and the failure to rivet bolts over the nuts or washers permits the removal of the brackets, guides or fastenings and the entering of the car without tampering with the seals and the replacing of these parts in such a way as to escape detection by ordinary examination.

"We find the first condition can be overcome by the use of a bracket or guide 2½ in. or more in height, which would be sufficient to allow for shrinkage in wood, the loss in rigidity and loosening of the hanger track, and still be high enough to prevent car being entered by the means above described.

"The second condition can be remedied by the use of round head bolts, riveted over nuts or washers on the inside of the door or sill which will prevent removal of the brackets, guides or fastenings by ordinary means."

The second communication stated, in part, as follows:

"A resolution was adopted by the International Association of Railway Special Agents and Police, based on many years experience and a report made by their committee on seals and fastenings to the effect that inasmuch as train crews and yard or seal clerks very seldom take a record of seals on

or note the condition of end doors on merchandise cars, which violation of the rules is supported to a considerable extent by the principle of 'Safety First' it is the sense of this Association that all end doors on cars now in use which require sealing be fastened permanently by means of a bolt ⅜ in. or more in thickness which should pass through end or side of the door about midway just above the fastenings and then through the car and be fastened on the inside by means of a nut which can be removed and replaced in case the car is to be loaded with a commodity necessitating the opening of the end door. This will obviate the necessity of sealing the end door as well as the taking a record of such seals.

"It is also suggested that in building new cars that end doors be eliminated when possible, and that when it is necessary to install them, that the fastenings be placed on the inside, and that they be so constructed as to cause the end door to lock automatically when it is closed, which will obviate the necessity for sealing.

"Quite a number of robberies are committed daily through the end openings, and, because of the failure of employes concerned to take a record of end door seals, it is practically impossible to determine point of robbery, which makes such thieves immune from capture."

The M. C. B. committee will go into the matter further with this Association.

A. B. Appler, (D. & H.): I would ask what the committee had in mind when applying the diagonal brace from center sill and bolster to the side sill and end sill, instead of applying it from the bolster and side sill toward the end sill and center sill. Just what is the minimum strength provided for in that arrangement.

Mr. Keisel: The reason for putting the diagonal brace that way was to concentrate any end shock on the center sill.

Mr. Appler: The thought in my mind was it might be more advantageous to brace the center sill than it would be to provide for the corner of the cars.

Mr. Keisel: The center sill is supposed to be strong enough to take any reasonable end shock the car receives. It has been found that by putting the brace on the car in that way, it saves a great deal of expense on repairs.

R. E. Smith, (A. C. L.): Has the committee considered the suitability of a steel sheathed car for warm climates and lines handling perishable products, vegetables and other shipments, that require ventilation and as cool a temperature as possible. Another thought is, what will be the effect on the life of the steel sheathed cars when such cars are devoted to the handling largely of commercial fertilizers which give off fumes of sulphuric acid which, combined with condensation on the steel sheathing, will subject them to rapid corrosion, due to the formation of dilute sulphuric acid.

Mr. Keisel: The committee did consider the question of such cars running in warm climates. For warm climates it is essential to line the car with wood, and it is also essential to ventilate it. If the car stands in the open sun the steel will absorb the heat from the rays of the sun, and though the outside temperature may be 90 deg., the steel may be 110, or 115 deg. Even though the car is merely a steel frame car, and not a steel sheathed car, the same thing obtains. Therefore, in order to keep down the temperature we will have to build an entirely wooden car. In regard to the sulphuric acid, we have the same conditions in coal cars. In the hopper bottom car it will be a matter of protecting it with paints, more or less impervious, and they should be impervious, if possible, to the action of the sulphuric acid.

G. F. Laughlin (Armour & Co.): I would ask the committee why it recommended that metal draft arms applied to wooden center sills extend 30 in. beyond the center line of the bolster. There are some types with 24 in. and 26 in., which give sufficient protection.

Mr. Keisel: The 30 in. referred to is an arbitrary figure. The support of the draught arm should be well beyond the center line of the bolster. Cars that have had 24 in. stood up quite well, but from what we saw of cars which had 30 in. beyond the center line of the bolster, the improvement was so great that we thought we ought to make that a minimum figure.

S. G. Thomson (P. & R.): Before this report is submitted to letter ballot, I want to call attention to several features regarding the draft gearing. The specification will show some radical departures from present practice, so that some members in reading it might think that if they voted for it they would have to immediately put it into effect. Take for instance 6a, which reads: "The draft attachments, including draft arms—if used, must be of metal, of either integral or riveted construction." That was put in to get rid of the old wooden draft arms which are giving us all of the trouble in the draft gear problem to-day. The committee thought seriously at one time in their conference, of including in the report a requirement that these specifications be compulsory for all cars in interchange after a certain number of years. However, there is no feature that brings out the actual time in which this method, if adopted by letter ballot as recommended practice, was to be put into effect; but the fact that the specification was approved would give everybody a chance to start, and possibly next year the committee would be in a position to say on what date the railroads of the country should agree for putting such a specification into use.

(It was voted to refer the specifications for box car outside hung side doors for new cars, the rules under draft gear, and recommendations concerning malleable cast iron and shearing values of structural, rivet and mild steel to letter ballot.)

SPECIFICATIONS AND TESTS FOR MATERIALS

The committee sent out for criticism Circular No. 14, containing the following proposed specifications, with the exception of those for Journal Bearings for Passenger and Freight Equipment Cars, which have been rewritten in line with criticisms received during the past year:

Structural Steel, Steel Plate and Steel Sheets for Passenger Equipment Cars.

Structural Steel, Steel Plate and Steel Sheets for Freight Equipment Cars.

Malleable-iron Castings for Passenger and Freight Equipment Cars.

Miscellaneous Steel Castings for Passenger and Freight Equipment Cars.

Journal Bearings for Passenger and Freight Equipment Cars.

Mild-steel Bars for Passenger and Freight Equipment Cars.

Rivet Steel and Rivets for Passenger and Freight Equipment Cars.

Galvanized Sheets for Passenger and Freight Equipment Cars.

All the criticisms, 22 roads replying, were considered by the committee, resulting in numerous changes and modifications in these specifications. The committee, therefore, recommends:

First: That these specifications (shown in Appendix B) be submitted to letter ballot as Recommended Practice.

Second: That the Specifications for Chain for Passenger and Freight Equipment Cars, Recommended Practice, be modified to include electric-welded chains. (These modifications are made with the idea of harmonizing the present chain specifications with the Iron and Steel Chain Specifications of the American Society for Testing Materials).

Third: That the following section be added under the subhead of "Physical Properties and Tests," in the present Specifications for Steam-heat Hose for Passenger Equipment Cars, Recommended Practice:

"*Digester Test.*—The digester shall consist of a cylinder containing dry saturated steam at a pressure of 45 lb. per sq. in. The hose shall be put into this digester and will remain there for 48 hours continuously. An examination of this section, after being submitted to the heat of the steam, should not disclose any blistering of the inner tube or any loosening of the tube from the fabric. Examination and test after heating, prescribed in the specifications, will be made as soon as possible after the specimen has cooled for 24 hours. The test will be made at a temperature of not less than 60 deg. F."

Fourth: That the label under Section 5 of the Specifications for Steam-heat Hose for Passenger Equipment Cars have added thereto, after the word "Road" the word "Steam," and after the date of manufacture, the Cars.

Fifth: That the changes shown in Appendix *A* be made in the Standard Specifications for Air-brake Hose for Passenger and Freight Equipment.

The changes in the air-brake hose specifications were made with the following objects in view:

(a) That the title of the present standard specifications include signal hose.

(b) Combining the Specifications and Tests for Woven and Combination Woven and Wrapped Air-brake Hose into the present Standard Specifications for Air-brake Hose.

(c) Eliminating Section 6, covering "Tensile Strength of Duck," which has proven unsatisfactory due to the difficulty in testing, and substituting therefor an addition to the requirements under "Bursting Test."

(d) Specifying the manner in which the thickness of the test specimen shall be measured and the instrument with which it shall be measured. This standardizes the practice of this Association with the Manufacturers' Association, United States Navy Department, and the Underwriters' Laboratories.

(e) Omit present Figure 1, page 672, 1914 Proceedings.

(f) A permissible variation as to location of label has been provided.

(g) The requirement of making tests within 90 days of date of shipment of material in the old specifications has been reduced to 60 days, as it is well to reduce this time as much as possible.

A test was conducted by the Canadian Pacific to determine if the present standard specifications amply protected the purchaser

against stiff hose under freezing conditions. This test has developed the fact that our present specifications, covering the tensile strength of the material in the tube is satisfactory, in so far as stiffness is concerned and, therefore, no changes are needed in the specifications to take care of this condition.

In addition to this work, the committee, with the Manufacturers' Association, still have in view the problem of a uniform test specimen, and although a large amount of work has been done upon this subject, progress only can be reported.

Prior to writing the present standard specifications an elaborate series of tests was started on various pieces of air-brake hose made in accordance with the ideas of the different manufacturers. This test is progressing and information is being accumulated.

It has been discovered that certain manufacturers' hose purchased under our standard specifications is showing rapid checking of the rubber in the cover after exposure to the weather. This matter is being made a subject of special investigation by the committee with the hope that something may be presented at the next meeting upon this subject.

The committee contemplates next year, in addition to the above, the following:

(a) Harmonizing of drop test for all sizes of axles under one weight of tup with the specification requirements of the American Society for Testing Materials.

(b) Taking under consideration and endeavoring to formulate Specifications for Recommended Practice, covering the following materials: Bolts and nuts, oxide of iron pigment, linseed oil, drier, paint vehicle, stencil paint.

(c) The committee is working with the manufacturers of insulating materials to the end that a standard method of testing this grade of material can be prescribed. Until this work can be completed it will be impossible to prepare a specification covering this grade of material.

The committee has received a communication from the chairman of the Coupler Committee, in which they recommend that the number of couplers required for test purposes on each lot of 1000 be reduced from a total of 13 to 8, by submitting but 5 instead of 10 couplers to the strike test. The committee, therefore, recommends that the specifications be reworded to incorporate this change.

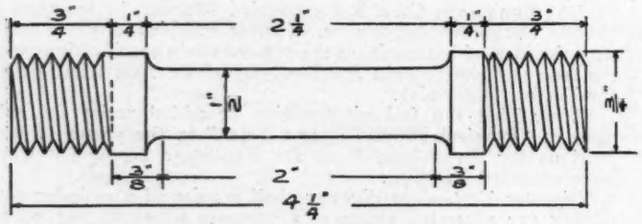


Fig. 1.—Test Specimen for Structural Steel, Steel Plate, and Miscellaneous Steel Castings

The report is signed by: C. D. Young (Penn.), chairman; J. J. Burch (N. & W.); A. Copony (G. T.); I. S. Downing (C. C. C. & St. L.); A. H. Fetters (U P.); H. B. MacFarland (A. T. & S. F.); J. R. Onderdonk (B. & O.); J. W. Taylor (Sec.); E. B. Tilt (C. P. R.), and Frank Zeleny (C. B. & Q.).

APPENDIX A

SPECIFICATIONS FOR AIR-BRAKE AND SIGNAL HOSE

1. Scope: These specifications supersede all previous specifications for Air-brake and Signal Hose, including that for "Woven and Combination Woven and Wrapped Air-brake Hose." Air-brake hose of the Woven and Combination Woven and Wrapped type shall meet all tests of these specifications, except that of friction, Section 4, on those constructions where friction can not be made.

Present Sections, 1, 2, 3, and 4 changed to Sections 2, 3, 4 and 5. Present Section 6 to be omitted. Present Figure 1 to be omitted.

8. Bursting Tests: Add to this paragraph the following: "After which the hydraulic pressure shall be increased to a minimum of 700 lb. per sq. in. without bursting, at the rate of not less than 100 or more than 200 lb. per five seconds."

9. Test Specimen: Add paragraph as follows: (b) "In measuring the thickness of the test specimen shown in Fig. 1 to determine the strength per square inch, a micrometer graduated to 0.001 in. having a shoe 0.24 to 0.26 in. in diameter, exerting a pressure of from 8 to 10 oz. on the test specimen shall be used."

Fig. 2 to be changed to Fig. 1.

14. Label: Change last sentence to read as follows: "This label shall be applied around the hose at a point 6 in. from the end, a variation of ½ in. either way will be permitted, and with the top of the lettering toward the center of the hose."

16. Rejection: Material which subsequently to above tests at the mills or elsewhere, and its acceptance or prior to being placed in service, develops weak spots or imperfections, or fails to pass any one of the tests herein required within sixty days from date of shipment, will be rejected and shall be replaced by the manufacturer at his own expense.

APPENDIX B

SPECIFICATIONS FOR STRUCTURAL STEEL, STEEL PLATE AND STEEL SHEETS FOR PASSENGER-EQUIPMENT CARS

I. MANUFACTURE

2. Process.—The steel shall be made by the open-hearth process.

II. CHEMICAL PROPERTIES AND TESTS

3. Chemical Composition.—The steel shall conform to the following requirements as to chemical composition:

Carbon, not over	0.25 per cent.
Manganese	Optional per cent.
Phosphorus, not over	0.05 per cent.
Sulphur, not over	0.05 per cent.

III. PHYSICAL PROPERTIES AND TESTS

6. Tension Tests.—(a) The material shall conform to the following requirements as to tensile properties:

	Structural Steel	Plates for Cold Flanging
Tensile strength, lb. per sq. in.	50 000—65 000	48 000—58 000
Yield point, min. lb. per sq. in.	0.5 tens. str.	0.5 tens. str.
Elongation in 8 in. min. per cent.	1 500 000	1 500 000
	Tens. str.	Tens. str.

(b) The yield point shall be determined by the drop of the beam of the testing machine.

7. Modification in Elongation.—(a) For material over ¾ in. in thickness, a deduction of 1 from the percentage of elongation specified in Section 6 (a) shall be made for each increase of ⅛ in. in thickness above ¾ in., to a minimum of 18 per cent.

(b) For material under 5-16 in. in thickness, a deduction of 2.5 from the percentage of elongation in 8 in., specified in Section 6 (a), shall be made for each decrease of 1-16 in. in thickness below 5-16 in.

8. Bend Test.—(a) The test specimen for structural steel shall bend cold through 180 deg. without cracking on the outside of the bent portion, as follows: For material ¾ in. or under in thickness, flat on itself; for material over ¾ in. to and including 1¼ in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen; and for material over 1¼ in. in thickness, around a pin the diameter of which is equal to twice the thickness of the specimen.

(b) The test specimen for plates for cold flanging shall bend cold through 180 deg. flat on itself without cracking on the outside of the bent portion.

9. Test Specimens.—(a) Tension and bend test specimens shall be taken from the rolled material.

(b) Tension and bend test specimens, except as specified in Paragraph (c), shall be of the full thickness of material as rolled; and may be machined to the form and dimensions shown in Fig. 1, or with both edges parallel.

(c) Tension and bend test specimen for plates and bars over 1½ in. in thickness or diameter may be machined to a thickness or diameter of at least ¾ in. for a length of at least 9 in.

10. Number of Tests.—(a) One tension and one bend test shall be made from each melt; except that if material from one melt differs ⅜ in. or more in thickness, one tension and one bend test shall be made from both the thickest and the thinnest material rolled. Shapes less than 1 sq. in. in section need not be subjected to a tension test.

(b) If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

(c) If the percentage of elongation of any tension-test specimen is less than that specified in Section 6 (a), and any part of the fracture is outside the middle third of the gage length, as indicated by scribe scratches marked on the specimen before testing, a retest shall be allowed.

IV. PERMISSIBLE VARIATIONS IN WEIGHT AND GAGE

11. Perimssible Variations.—The cross section or weight of each piece of steel shall not vary more than 2.5 per cent. from that specified; except in the case of sheared plates, which shall be covered by the following permissible variations to apply to single plates:

(a) *When Ordered to Weight.*—For plates 12½ lb. per sq. ft. or over:

Under 100 in. in width, 2.5 per cent. above or below the specified weight; 100 in. or over in width, 5 per cent. above or below the specified weight.

For plates under 12½ lb. per sq. ft.:

Under 75 in. in width, 2.5 per cent. above or below the specified weight.

75 to 99 in., inclusive, in width, 5 per cent. above or 3 per cent. below the specified weight.

100 in. in width or over, 10 per cent. above or 3 per cent. below the specified weight.

(b) *When Ordered to Gage.*—The thickness of each plate shall not vary more than 0.01 in. under that ordered.

An excess over the nominal weight corresponding to the dimensions on the order shall be allowed for each plate, if not more than that shown in the following table, 1 cu. in. of rolled steel being assumed to weigh 0.2833 lb.

Thickness Ordered, In.	Nominal Weight, Lb. per Sq. Ft.	Allowable Excess (Expressed as Percentage of Nominal Weight), for Width of Plates, as Follows:						
		Under 50 in.	50 in. to 70 in. excl.	70 in. or over.	Under 75 in.	75 in. to 100 in. excl.	100 in. to 115 in. excl.	115 in. or over.
¼ to 5/16	5.10 to 6.37	10	15	20	.....	.....	.....	.....
5/16 to 7/16	6.37 to 7.65	8.5	12.5	17	.....	.....	.....	.....
7/16 to ½	7.65 to 10.20	7	10	15	.....	.....	.....	.....
½	10.20	.....	.....	.....	10	14	18	.....
5/8	12.75	.....	.....	.....	8	12	16	.....
¾	15.30	.....	.....	.....	7	10	13	17
7/8	17.85	.....	.....	.....	6	8	10	13
1	20.40	.....	.....	.....	5	7	9	12
1 1/8	22.95	.....	.....	.....	4.5	6.5	8.5	11
1¼	25.50	.....	.....	.....	4	6	8	10
Over 1¼	.....	.....	.....	.....	3.5	5	6.5	9

(c) A variation from the length ordered of ⅛ in. either way will be permitted for lengths 12 ft. and under and ¼ in. either way will be permitted for lengths over 12 ft.

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

SPECIFICATIONS FOR STRUCTURAL STEEL, STEEL PLATE AND STEEL SHEETS FOR FREIGHT-EQUIPMENT CARS

These specifications are the same as those for passenger equipment cars with the exception of the section on physical properties and tests, which is as follows:—[EDITOR].

III. PHYSICAL PROPERTIES AND TESTS

6. Bend Tests.—(a) The test specimen for structural steel shall bend cold through 180 deg. without fracture on the outside of the bent portion as follows: For material ¾ in. in thickness and under, flat on itself; for material over ¾ in. to and including 1¼ in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen; and for thicknesses over 1¼ in. around a pin the diameter of which is equal to twice the thickness of the specimen.

(b) Angles ¾ in. or under in thickness shall open flat, and angles ½ in. or under in thickness shall bend shut, cold, without fracture.

NOTE.—The above tests may be made either by pressure or by blows.

(c) Bend test specimens shall be 1½ in. or over in width by the thickness of the material, with planed or milled edges.

7. Number of Tests.—At least one bend test for structural steel shall be made for each thickness from each melt, and shall be taken from the finished product.

SPECIFICATIONS FOR MALLEABLE-IRON CASTINGS FOR PASSENGER AND FREIGHT EQUIPMENT CARS

I. MANUFACTURE

1. Process.—Malleable-iron castings may be made by either the open-hearth, air furnace or electric furnace process.

2. Annealing.—Malleable castings shall be neither over nor under annealed.

II. PHYSICAL PROPERTIES AND TESTS

3. Tensile Test.—The tensile strength of the standard test bar shall not be less than 38,000 lb. per sq. in. with an elongation, measured in 2 in., of not less than five per cent.

4. Transverse Test.—The standard transverse test bar, tested cope side up and on supports 12 in. apart, with the load applied at the center shall show the following deflection:

900 lb. with 1.25 in. deflection in ½ in. specimen
1400 lb. with 1.00 in. deflection in ⅝ in. specimen
2000 lb. with 0.75 in. deflection in ¾ in. specimen

NOTE.—The test specimen shall be 14 in. long, 1 in. wide and either ½, ⅝ or ¾ in. thick, these thicknesses to be proportional to the thickness of the material which they represent.

7. Standard Test Bars.—All test bars shall be cast without chills, and with the ends left perfectly free in the molds, using heavy risers of sufficient height at each end to insure sound bars. Of the bars selected, two tensile and two transverse test bars shall be cast in one mold. Where the full heat goes into castings which are subject to specifications, two molds shall be poured within five minutes after tapping into the first ladle and two from the last iron of the melt. Molds shall be suitabley stamped to insure identification of the bars, the bars being annealed with the castings. Where only a partial melt is required for work in hand, two molds shall be cast from the first ladle used and two after the required iron has been tapped.

(a) *Tensile Test Bars.*—The test bar as cast shown in Fig. 2 shall be used for all tensile tests.

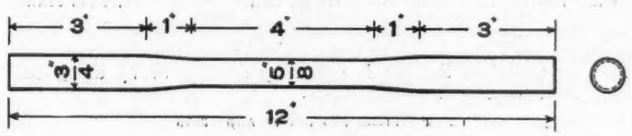


Fig. 2.—Test Specimen for Malleable Iron Castings

(b) *Transverse Test Bars.*—The purchaser and the manufacturer may agree upon a transverse test bar, as cast, the width of which shall be 1 in., the thickness ½ in., ⅝ in. or ¾ in., depending upon the thickness of the castings represented, and the length to be 14 in.

8. Number of Tests.—Of the test bars required for each melt, two shall be tested for tensile strength and elongation and two for transverse deflection; these bars shall be taken from the hottest and coldest parts of the annealing furnace.

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR].

SPECIFICATIONS FOR MISCELLANEOUS STEEL CASTINGS FOR PASSENGER AND FREIGHT-EQUIPMENT CARS

I. MANUFACTURE

1. Process.—The steel may be made by the open-hearth, crucible or any other process approved by the purchaser.

2. Heat Treatment.—Castings shall be allowed to become cold, they shall then be uniformly reheated to the proper temperature to refine the grain (a group thus reheated being known as an annealing charge), and allowed to cool uniformly and slowly. If, in the opinion of the purchaser or his representative, a casting is not properly annealed, he may at his option require the casting to be reannealed.

II. CHEMICAL PROPERTIES AND TESTS

8. Chemical Composition.—The steel shall conform to the following requirements as to chemical composition:

Carbon .....Optional per cent.
Manganese .....Optional per cent.
Phosphorus, not over.....0.05 per cent.
Sulphur, not over.....0.05 per cent.

III. PHYSICAL PROPERTIES AND TESTS

6. Tension Tests.—The steel shall conform to the following minimum requirements as to tensile properties:

Tensile strength, lb. per sq. in.....60 000
*Elongation in 2 in., per cent.....1 400 000/tensile strength
Reduction of area, per cent, 30.

*Not under 22 per cent.

7. Alternative Tests to Destruction.—In the case of small or unimportant castings, a test to destruction on three castings from a lot may be substituted for the tension tests.

8. Test Specimens.—(a) Sufficient test bars, from which the test specimens required in Section 9 may be selected, shall be attached to castings weighing 500 lb. or over, when the design of the castings will permit. If the castings weigh less than 500 lb., or are of such a design that test bars cannot be attached, two test bars shall be cast to represent each melt; or the quality of the casting shall be determined by tests to destruction as specified in Section 7. All test bars shall be annealed with the castings they represent.

9. Number of Tests.—One tension test shall be made from each melt.

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

SPECIFICATIONS FOR JOURNAL BEARINGS FOR PASSENGER AND FREIGHT-EQUIPMENT CARS

1. Classification.—This specification will cover two grades of bearings and will be known as *A* and *B*.

I. CHEMICAL PROPERTIES AND TESTS

2. Composition of Shell.—The shell shall conform to the following requirements as to chemical composition:

SHELL	A.	B.
Lead	24.0 to 30.0 per cent.	8.0 to 16.0 per cent.
Tin, not less than	4.0 per cent.	7.0 per cent.
Zinc and other impurities, not over	3.0 per cent.	3.0 per cent.
Copper, not less than	65.0 per cent.	Not over 82.0 per cent.

3. Composition of Lining.—The lining metal shall conform to the following requirements as to chemical composition:

LINING	Up to ⅛ In.	⅛ In. and Over.
Lead	94.0 to 96.0 per cent.	Not over 88.0 per cent.
Antimony and Tin	3.0 to 5.0 per cent.	17.0 per cent.
Tin	0.50 to 1.5 per cent.	.....
Other impurities, not over	0.5 per cent.	0.75 per cent.

4. Analysis.—The sample for chemical analysis shall be taken from the shell and lining at three points along the fractured surface, described in Section 5, either by drilling or by using cuttings thus obtained, well mixed.

II. PHYSICAL PROPERTIES AND TESTS

5. Tests.—The finished bearing representing a lot for acceptance shall be broken along the center line of the bearing, without nicking, in order to ascertain the uniformity of the grain of the metal. When this fracture shows distinct signs of imperfect mixing, such as separation of component parts and dross or dirt spots, the lot shall be rejected.

6. Number of Tests.—Bearings shall be divided into lots of three hundred or less and one bearing shall be taken for test and chemical analysis from each lot.

III. PERMISSIBLE VARIATIONS IN GAGINGS

7. Gaging.—All bearings shall conform to gages and dimensions shown on drawings, and when linings are required they shall conform to the gages and dimensions for linings as shown on drawings.

IV. MARKING

8. Marking.—Each lot of three hundred or less shall bear a serial number, commencing with one at the beginning of the year and continuing consecutively until the end of the year, the year when cast, and the pattern number, legibly cast, by depressing the letters, on the sloping surface of the shoulder of the brass, and on the opposite sloping shoulder the railroad company's initials, M. C. B., and either "A" or "B," depending on the composition of the metal, and the figures to show the size of the journal bearing, and on the collar the manufacturer's name or trade-mark. All letters to be ¾ in. high, except the manufacturer's name or trade-mark which should be the width of the shoulder or collar. The above marking shall be in accordance with Fig. 3.

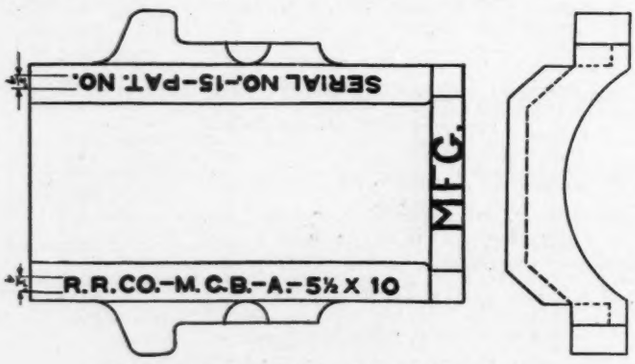


Fig. 3.—Marking for Journal Bearings

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

SPECIFICATIONS FOR MILD STEEL BARS FOR PASSENGER AND FREIGHT-EQUIPMENT CARS

I. MANUFACTURE

2. Process.—The steel shall be made by the open-hearth process.

II. CHEMICAL PROPERTIES AND TESTS

3. Chemical Composition.—The steel shall conform to the following requirements as to chemical composition:

Carbon .....Optional per cent.
Manganese .....Optional per cent.
Phosphorus, not over.....0.05 per cent.
Sulphur, not over.....0.05 per cent.

*This material may be used when so desired for rivet steel.

III. PHYSICAL PROPERTIES AND TESTS

6. Tension Tests.—The steel shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in....50 000-65 000 for sizes smaller than 1 in flats and 2 in. rounds.
Tensile strength, lb. per sq. in....50 000-60 000 for larger sizes.
Elongation in 8 in., per cent.....1 500 001 tensile strength.

7. Yield Point.—The yield point as determined by the drop of the beam of the testing machine shall be one-half the ultimate tensile strength.

8. Bend Test.—The test specimen for rounds, squares and hexagon bars shall bend cold through 180 deg. without cracking on the outside of the bent portion, as follows: For material ¾ in. or under in thickness, flat on itself; for material over ¾ in. to and including 1¼ in. in thickness, around a pin the diameter of which is equal to the thickness of the specimen; and for material over 1¼ in. in thickness, around a pin the diameter of which is equal to twice the thickness of the specimen.

9. Test Specimen.—Tension and bend-test specimens shall be of the full section of material as rolled, if possible; otherwise the specimen shall be machined from the material as rolled. The axis of the specimen shall be located at any point one-half the distance from the center to the surface of round bars, or from the center to the edge of flat bars, and shall be parallel to the axis of the bar.

10. Number of Tests.—(a) All bars of one size shall be piled separately. One bar from each 200 or less shall be selected at random and tested as specified.

IV. PERMISSIBLE VARIATIONS IN GAGE

11. Permissible Variations.—(a) *Round Bars.*—Round bars shall conform to the limits as given in Table No. 1.

TABLE No. 1

NOMINAL DIAMETER OF STEEL IN.	Large Size End, In.	Small Size End, In.	Total Variation, In.
¼	0.2550	0.2450	0.010
5/16	0.3180	0.3070	0.011
⅜	0.3810	0.3690	0.012
7/16	0.4440	0.4310	0.013
½	0.5070	0.4930	0.014
9/16	0.5700	0.5550	0.015
⅝	0.6330	0.6170	0.016
¾	0.7585	0.7415	0.017
⅞	0.8840	0.8660	0.018
1	1.0095	0.9905	0.019
1⅛	1.1350	1.1150	0.020
1¼	1.2605	1.2395	0.021
1⅜	1.3860	1.3640	0.022
1½	1.5115	1.4885	0.023
1⅝	1.6370	1.6130	0.024
1¾	1.7625	1.7375	0.025
1⅞	1.8880	1.8620	0.026

Round steel 2 in. and over in diameter shall not be under size or more than 1/32 in. greater in diameter.

(b) *Flat Bars.*—Thickness shall not vary more than corresponding diameter for rounds; thus, 1 in. thick could vary from 0.9905 to 1.0095 in.

(1) Sizes under 3 in. wide shall not be more than 1/32 in. under or over size in width.

(2) Sizes 3 in. and over shall not be under size or more than 1/16 in. wider than ordered.

[NOTE.—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

SPECIFICATIONS FOR RIVET STEEL AND RIVETS FOR PASSENGER AND FREIGHT-EQUIPMENT CARS

I. MANUFACTURE

1. Process.—The steel shall be made by the open-hearth process.

II. CHEMICAL PROPERTIES AND TESTS

2. Chemical Composition.—The steel shall conform to the following requirements as to chemical composition:

Carbon .....Optional per cent.
Manganese .....Optional per cent.
Phosphorus, not over.....0.05 per cent.
Sulphur, not over.....0.05 per cent.

5. Number of Samples for Chemical Analysis.—One bar from every 200 bars or less of each different size of section shall be taken, and a piece 2 ft. long shall be cut off and given the purchaser or his representative, or 10 rivets from every 100 kegs. These samples shall be used for check analysis by the purchaser.

III. PHYSICAL PROPERTIES AND TESTS

6. Tension Tests.—The bars shall conform to the following requirements as to tensile properties:

Tensile strength, lb. per sq. in.....45 000-60 000
Elongation in 8 in., per cent.....1 500 000/tensile strength

7. Bend Tests.—The test specimen shall bend cold through 180 deg. flat on itself without cracking on the outside of the bent portion.

8. Test Specimens.—Tension and bend-test specimens shall be of the full-size section of bars as rolled.

9. Number of Tests.—(a) All bars of one size shall be piled separately. One bar from each 200 or less shall be selected at random and tested as specified.

[Permissible variations are the same as those given in the specifications for mild-steel bars.—EDITOR.]

16. Bend Tests.—The rivet shank shall bend cold through 180 deg. flat on itself, without cracking on the outside of the bent portion.

17. Flattening Test.—Rivet heads shall be flattened down cold to a thickness of one-third, and when hot to a thickness of one-fourth, of the original diameter of the shank at the working heat when driving without splitting.

18. Number of Tests.—One of each of the above tests shall be made for each 100 kegs for each different size of rivets.

19. Size of Heads.—Standard rivet heads shall conform to the following:

Size Diameter, In.	Head.		Countersunk.	
	Height, In.	Diameter, In.	Depth, In.	Diameter, In.
1/2	3/8	7/8	1/4	25/32
5/8	29/64	1 1/16	5/16	1
3/4	17/32	1 1/4	3/8	1 3/16
7/8	39/64	1 7/16	7/16	1 3/8
1	11/16	1 5/8	1/2	1 9/16
1 1/8	49/64	1 13/16	9/16	1 3/4
1 1/4	27/32	2	5/8	1 15/16

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

SPECIFICATIONS FOR GALVANIZED SHEETS FOR PASSENGER AND FREIGHT EQUIPMENT CARS

I. MANUFACTURE

1. Process.—The sheet material manufactured under this specification may be either a mild steel or iron made from puddled bars made wholly from pig iron, and shall be thoroughly cleaned before being coated.

II. PHYSICAL PROPERTIES AND TESTS

2. Bend Test.—Test specimen as described in Section 3 shall be subjected to the following tests:

(a) Test specimen shall bend double on itself around two thicknesses of the material tested and straightened, without showing any cracking or flaking of the galvanizing on either side of the test specimen.

(b) Test specimen of the base material shall bend twice in the same direction, first around a mandrel the diameter of which is equal to 15 gages of the material tested and straightened, and then bent flat on itself and straightened, without cracking of the specimen.

(c) Gages 26 and lighter shall double-lock seam without cracking of the sheet or galvanizing.

3. Test Specimen.—(a) Strips about 8 in. long and 2 in. wide shall be cut from the center of a sheet selected at random from each lot of 1000 sheets or less, and the average thickness or weight of the coating across this width shall be used.

(b) Corrugated sheets shall be flattened with a wooden maul before making the required tests.

IV. PERMISSIBLE VARIATIONS

6. Permissible Variations.—(a) The inspector shall weigh and check the measurements of one sheet in each 200 sheets in each order or shipment.

(b) A variation in weight of the finished sheet of 2½ per cent either way from that shown in the following table will be allowed.

*Gage No.	Thickness of Sheets, In.	Weight of Sheets per Sq. Ft., Oz.	Minimum Weight of Coating per Sq. Ft., Oz.	*Gage No.	Thickness of Sheets In.	Weight of Sheets per Sq. Ft., Oz.	Minimum Weight of Coating per Sq. Ft., Oz.
16	.0625	42.50	2.00	25	.021875	16.50	1.45
18	.0500	34.50	1.90	26	.01875	14.50	1.40
20	.03750	26.50	1.80	27	.017187	13.50	1.35
22	.03125	22.50	1.70	28	.015625	12.50	1.30
23	.028125	20.50	1.60	30	.0125	10.50	1.30
24	.0250	18.50	1.50				

*The above gage is of the finished sheet.

[NOTE:—Only the more important paragraphs of these specifications are printed here.—EDITOR.]

(The report will be submitted to the association by letter ballot for adoption as recommended practice.)

TANK CARS

The report was submitted by A. W. Gibbs, (Penna.) who said: As chairman of the Tank Car Committee, I have taken the responsibility of making no recommendations affecting the tank car specifications this year. This is not for the reason that the committee does not feel that certain changes should be made in the Specifications. After the meeting of the committee, however, complaint with respect to the 60 lb. test pressure required for cars carrying inflammables was made before the Interstate Commerce Commission by the National Petroleum Association and others, against the Pennsylvania Railroad and the Atchison, Topeka and Santa Fé directly, but, really, as stated in the complaint, against "railroads generally throughout the United States, too numerous to be made defendants." The complainants ask the commission to restrain the railroads from enforcing the requirements of the specification, and to find and put into effect such pressure test as it may find to be just and reasonable. If the complaint is sustained, it is probable that other requirements of the specifications may be attacked, and it may be necessary to change the whole specification. It is therefore felt that it would be unwise to make any change in the present specifications until it is known by the decision of the commission in this case whether they are to be reversed or modified by the commission.

A number of questions of tank car owners are now before the committee.

As regards the recommendation of the Arbitration Committee that the Tank Car Committee name a date after which tank cars not strictly complying with the M. C. B. Tank Car Specifications shall not be received in interchange, the committee recommends that this question be held in abeyance for one year, for the reasons already given for not taking any action concerning tank cars at this time.

THE LAMENT OF THE FOREIGN BAD-ORDER EMPTY CAR

At the opening of the afternoon session yesterday, when the rules of interchange were under consideration, Secretary Taylor read the following amusing anonymous poem with the above caption:

No one seems to care
  How many moves I make;
No one seems to worry
  At the circuitous routes I take.
No one sees me moving
  From Maine to Californ—
And I get so tired and weary
  I wish I never was born.
No one wants to fix me,
  No one will spend a cent
To put me in good condition,
  So I can earn the rent.
My owner will pay the money,
  As soon as the work is done,
As soon as I'm fixed and ready
  To go out on the road and run.

But it's always the same old story,
  As I wander from road to road,
In search of a friendly fellow,
  Who'll fix me up for a load.
"There's nothing allowed to repair you,"
  Is all they say at each place,
"We need all the money allowed us,
  To keep our own cars in the race."
And so I just wander and wander,
  O'er the face of the whole country wide,
With a "Bad Order—Return When Empty"
  Carding upon my side.
Somebody ought to fix me,
  I don't *want* to roam,
So if you can't spare the money,
  Please, sir, *please* send me home.

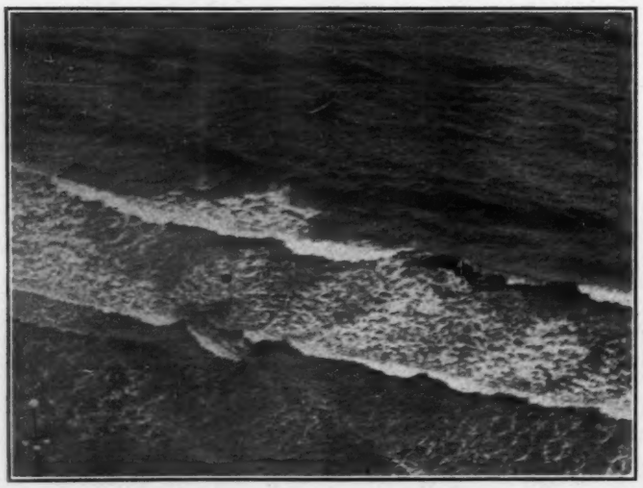
THE DRIVING CONTEST IN PICTURES

The Daily published yesterday an account of the golf driving contest from the roof of the Hotel Traymore over the Boardwalk into the ocean which was participated in by D. R. MacBain, C. F. Street and S. P. Bush. While the driving was going on a photographer was stationed on the dome just back of the tee, but the pictures taken were not finished in time to be reproduced in yesterday's *Daily*. They are given herewith, and they probably illustrate the highest golf driving

George Carr and Will Johnson Just Before They Went to Sea

contest ever held in the history of the great Scotch game. The publicity agent of the hotel confides to us that the roof of the Traymore is the most elevated point on the Atlantic Coast south of the Statue of Liberty, and in the absence of evidence to the contrary we take his word for it.

The players can be very distinctly seen in the photographs. The judges are less fortunate. Even in the picture of them going to sea the familiar features of Will Johnson and George Carr cannot be recognized. In the other pictures the boat



The Judges Going to Sea

and its occupants are shown as a mere blur because when the camera was snapped the boat was doing gymnastic stunts as energetic as the army setting-up exercises.

We present a photograph taken of Messrs. Carr and Johnson just before they went aboard. We regret not to be able to present one of them just after they came ashore, for the contrast between Mr. Carr's clothes before and after a large

C. F. Street Showed Excellent Form

roller from mid-ocean had swamped him was striking. Everybody who has seen the picture of C. F. Street admires the

D. R. MacBain Driving—The Judges' Boat in the Distance To the Left of the Cross

excellent golf form he showed even though he did not get the distance attained by S. P. Bush.

S. P. Bush Winning the Driving Contest on the Traymore's Roof

ADDITIONAL MASTER CAR BUILDERS' REGISTRATION

Brown, F. S., M. E.; Erie R. R.
Bundy, C. L., G. F.; D. L. & W.; Haddon Hall.
Burch, J. J., D. C. I.; Nor. & West.; Rudolf.
Dillon, S. J., M. M.; P. R. R.; Pennhurst
Elliott, B. F., M. C. B.; Havana Central; Blenheim.
Gibbs, A. W., C. M. E.; P. R. R.; Chelsea.
James, Charles, Mech. Supt.; Ene.; Dennis.
Maginn, J. J., G. F. S.; Cin. Nor.; Arlington.
Martin, J. H., Supt. Car Service, Berwind White Coal Mining Co.
Mengel, J. C., M. M.; P. R. R.
Ott, William H., M. M.; P. R. R.; Chalfonte.
Quinn, C. H., A. E. M. P.; N. & W.
Shoemaker, C. A., General Supt.; German American Car Lines; Traymore.
Smith, Henry J., General Car Inspector; D. L. & W.; Monticello.
Smith, John E., M. M.; P. S. & N.; Monticello.
Spence, A. N., T. I.; Southern; Arlington.
Totten, E. C., D. G. C. F.; N. Y. C.; Pennhurst.

ADDITIONAL SPECIAL GUESTS

Battenhause, Wm., Gen. Car Foreman; B. & O.; Dennis.
Bernheisel, L. W., Supt. (Asst.) Car Service; Berwind-White Coal Mining Co.
Blake, F. H., M. P. Inspector; P. R. R.
Boltz, Fred. W., Traf. Mngr.; Nat. Petroleum Assn.; Blenheim.
Brown, B. S., Foreman Office Mech. Eng.; P. R. R.
Burr, H. S., Supt. Stores; Erie; Dennis.
Carmichael, N., Gen. Mgr.; Arizona & New Mexico Co.
Courtney, A. S., Asst. Machinist Foreman; Penna. Lines West; Dennis.
Flaherty, W. P., Round House Foreman; B. & O.
Forney, Ed. O., Asst. Examiner U. S. Patent Office; U. S. Government; Chalfonte.
Gallagher, F. S., Asst. Engineer; N. Y. C.; Blenheim.
Green C. B., Foreman Car Shops; P. R. R.
Griest, E. E., M. M.; Penna. Lines West; Dennis.
Haig, J. Frank, Reg. Clerk; P. R. R.
Hall, C. B., Inspector, Pur. Dept.; P. R. R.
Hightower, R. E., Commercial Agt.; Macon & Birmingham; Haddon Hall.
Holslag, C. J., Asst. Engr., Engrg. Dept.; N. Y. C.
Koch, Philip, Foreman Engine House; C. R. R. of N. J.
Ludlum, George, Eng.; P. R. R.
Mackey, W. C., Passenger Car Foreman; B. & O.; Chelsea.
Martin, H. B., Pur. Agent; Coal & Coke.
Martin, K. H., General Equipment Inspector; Southern; Fradonia.
Meloy, H. C., Elec. Eng.; N. Y. C.; Dennis.
Morningstar, Mr. E. E., Draftsman; B. & O.; Traymore.
Morris, J. C., Foreman Car Shops; Cumberland Valley; Monticello.
Patrain, B. F., Foreman Car Repairs; Southern; Elberon.
Patterson, G. W., Asst. Supt.; Penna. Lines West; North Villa.
Peterson, E. W., Clerk; Boston & Albany; Pennhurst.
Pfieffer, C. A., M. P. Inspector; P R. R.; Arlington.
Renner, C. W., Asst. Genl. Foreman Shops.
Riley, Thomas E., Special Agent; P. R. R.
Roberts, A. L., Mech. Eng.; L. V.; Traymore.
Runkle, D. F., For. Car Shops; P. & R.; Somerset.
Schuyler, A. J., Gen. Car Inspector; Virginian; Arlington.
Sensenbach, C. A., Foreman Blacksmith Shop; P. R. R.; Wellsborough.
Shea, L. M., Lieut. U. S. N.; Chalfonte.
Sheedy, M. M., Inspector; P. R. R.
Sheen, John, M. C. B.; A. & W. P.; Lexington.
Smith, C. B., Mech. Engr.; B. & M.
Smith, E. W., Asst. M. M.; P. R. R.; Shelburne.
Spengler, E. A., Asst. Road For. of Engines; P. R. R.; Bowker.
Stadelman, J. H., Asst. Eng.; P., W. & W. R. R.
Stewart, Lewis, Foreman of Car Shop; P. R. R.
Sweeley, E. A., M. C. B.; S. A. L.; Chelsea.
Tapman, W. H., Inspector; B. & O.; Arlington.
Tenske, F. J., Foreman; P. R. R.; Lexington.
Thomas, John H., Engineman; C. R. R. of N. J.; Lyric.
Wayne, Albert G., Asst. Engine House Foreman; P. R. R.; Islesworth.
Weight, Geo. C., Foreman Car Dept.; P. R. R.; Colonial.
Wenzel, C. F., Foreman Freight Dept.; P. R. R.; Colonial.
Wescott, E. A., Consulting Engineer; Erie; Traymore.
Williamson, G. B., M. C. B. Inspector; B. & O.; Bouvier.
Woticky, C. B., Insp. Elec. Dept.; N. Y. C.
Williams, C. B., P. A.; C. R. R. of N. J.; Shelburne.
William, Frank, Supt. Car Shop; Westmoreland Coal Co.; Craig Hall.

THE WINNERS IN THE GOLF TOURNAMENT

The tie for the prizes in the medal handicap of the golf tournament was played off yesterday by D. R. MacBain, C. R. Naylor, and George A. Post, Jr. Mr. MacBain won the first prize with a score of 108-36-72; Mr. Naylor won the second with 108-31-77, and Mr. Post was third with 104-26-78.

The tie for the third prize in the kickers' handicap also was played off, the winner being W. J. Tollerton.

M. C. B. CARNIVAL DANCE

The M. C. B. Carnival Dance last night was in point of its success as well as in many other respects, a repetition of the carnival dance of last week. One of the features of the program was a skating act by Miss E. M. Kegel and Harry Walls. Miss Betty Lee also sang some of the best songs from her repertoire. The music was furnished by the Don Richardson orchestra.

The committee in charge of the dance included Langley Ingraham, chairman; Burton W. Mudge, J. F. Forney, H. W. Hegeman, G. R. Berger, D. E. Sawyer, W. H. Bentley and C. W. F. Coffin. The crowd was large and everybody seemed to have a very merry time.

LITTLE INTERVIEWS

Co-operation between the Interstate Commerce Commission and the railways was the keynote of an interview given yesterday by George B. McGinty, secretary of the commission, regarding the legislation recently enacted by Congress extending the regulatory authority of the commission over the entire locomotive. "It will be necessary," said Mr. McGinty, "to draw up rules and regulations for the application and administration of this legislation. We recognize the fact that this will not be an easy task and that if it is to be done satisfactorily it will be necessary for the representatives of the commission and of the railways to co-operate frankly and fully. The commission usually has received the close co-operation of the representatives of the carriers in the administration of the boiler inspection law, and I am sure that we will receive it in the application of broader provisions of the new law. The better the understanding reached and carried out, the more satisfactory the results would be for all concerned."

WILLIAM S. MORRIS DEAD

Word was received from Mrs. W. S. Morris, of Fort Wayne, that Mr. Morris died at 4 o'clock Tuesday morning. Mr. Morris is well known because of the interest that he took in the work of both the Master Car Builders' and Master Mechanics' Association; he was president of the latter in 1900-01. He was born March 4, 1857, at Chicago, and was educated in the public schools of that place and at the Cook County Normal School. He entered railway service in 1874 as a machinist apprentice on the Housatonic and at the completion of his apprenticeship worked as a journeyman machinist on that road and on the Wabash. In 1879 he became a locomotive fireman, later being advanced to the position of engineer and then becoming master mechanic of the Fort Wayne, Cincinnati & Louisville. In 1884 he went with the Missouri Pacific as master mechanic, but in 1886 returned to the Wabash as master mechanic of the eastern division. In 1889 he was made superintendent of motive power and rolling stock of the Chicago & West Michigan; Detroit, Lansing & Northern; and Saginaw Valley & St. Louis roads. From April, 1893, to June, 1902, he was superintendent of motive power of the Chesapeake & Ohio, leaving to take the position of mechanical superintendent on the Erie in June, 1902, and remaining in that position until April, 1904. For a short time he was in the supply business and then returned to the Chesapeake & Ohio remaining in the transportation department of that road for two or three years, after which he retired and has since been living in Fort Wayne, Ind.

Conventionalities

Amos Turner, master mechanic of the Lehigh Valley, who is attending the conventions, has been in the service of that road over 50 years. He is commonly known as the "Grand Old Man."

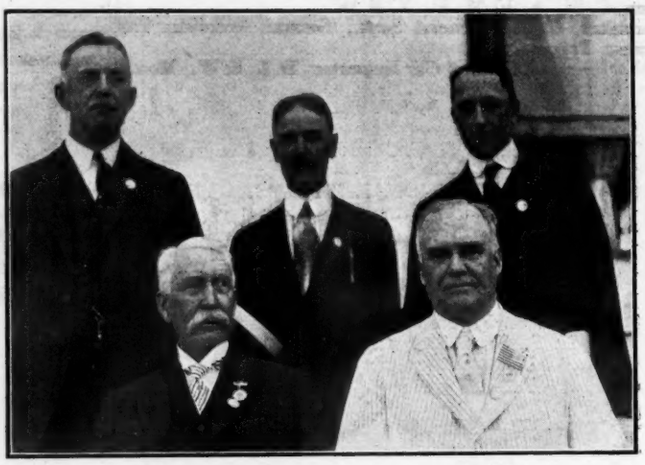
R. W. Burnett, vice-president of the M. C. B. Association, who until recently was with the Canadian Pacific, will not be at the convention. He is making an extensive western trip which will include a visit to the Panama Exposition.

Wm. Schlafge, Gen. Supt. of Motive Power, Erie Railway

Frank A. Barbey, of good old Boston town won't have as good an opportunity to distribute his American flags this year on June 17, Bunker Hill Day, as the conventions come earlier than usual. However, he wants us all to remember that that is the day Boston should be sacredly remembered.

Among the missing faces are those of O. C. Gayley, vice-president of the Pressed Steel Car Company, and J. F. MacEnulty, general manager of sales of the same concern. Mr. Gayley is of a retiring disposition and makes little noise, while Mr. MacEnulty is the reverse. By the law of averages, therefore, the hole in this year's din, made by their absence, is sufficiently large to be noticeable.

F. C. Pickard, master mechanic of the Lackawanna at Buffalo, brings word from his general foreman, W. W. Scott,



THE ARBITRATION COMMITTEE

Top Row, Left to Right—James Coleman, Supt. Car Dept., Grand Trunk; T. H. Goodnow, Asst. Supt. Car Dept., C. & N. W., and T. W. Demarest, Supt. Motive Power, Penna. Lines.

Bottom Row—J. J. Hennessey, M. C. B., C. M. & St. P., and F. W. Brazier, Supt. Rolling Stock, N. Y. C.

who is president of the International Railway General Foremen's Association, that all of the reports for the annual meeting of that association are in hand and will shortly be issued in printed form so that the members will have plenty of time to study them over in advance of the meeting next July.

TWO PITTSBURGH & LAKE ERIE FAMILIES

Master Car Builder Sam Lynn, with Mrs. Lynn and Daughter on the Left, and Mechanical Engineer W. P. Richardson, with Wife and Daughter Alice on the Right

Charles A. Lindstrom, assistant to president of the Pressed Steel Car Company, is a grandfather, a little daughter having been born to Mr. and Mrs. Frank Cairns, of Toronto, on Sunday, June 6. Mrs. Cairns used to attend these conventions as Miss Charlotta Lindstrom, and was married last spring. Mr. Lindstrom's daughter Jean, also a regular conventionite, was married on June 8 to John Clark, of Clarksburg, Va. Mr. and Mrs. Clark wil live in Pittsburgh.

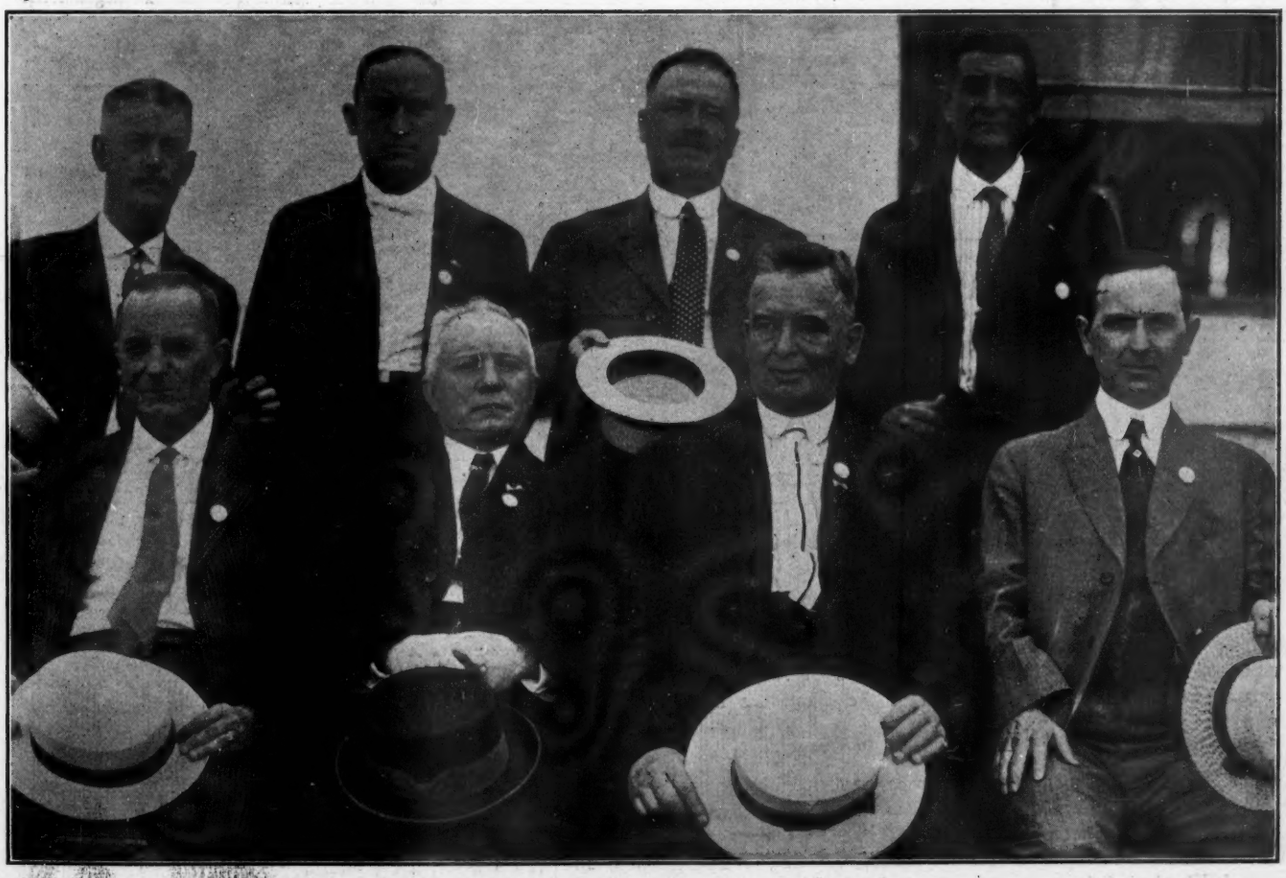
Some of the Thirty-Five Members of the Illinois Athletic Club Who Are in Attendance at the Convention

Top Row—W. H. Bentley, Will Miller, F. L. Barber. W. L. Allison, C. W. Floyd Coffin, C. J. Olmstead, L. D. Mitchell, C. J. Blatchford.

Second Row—William Anderson, C. C. Farmer, B. W. Mudge, B. Pratt, R. W. Benson, Frank O'Brian.

Third Row—Joe Brown, George H. Porter, W. J. Walsh, Albert MacRae, Claude Baker, John P. Landreth.

Bottom Row—Egbert H. Gold, Joe Buker, L. R. Phillips, S. W. Midgley, J. Will Johnson, Frank L. Johnson, W. M. Wilson, C. N. Thulin.



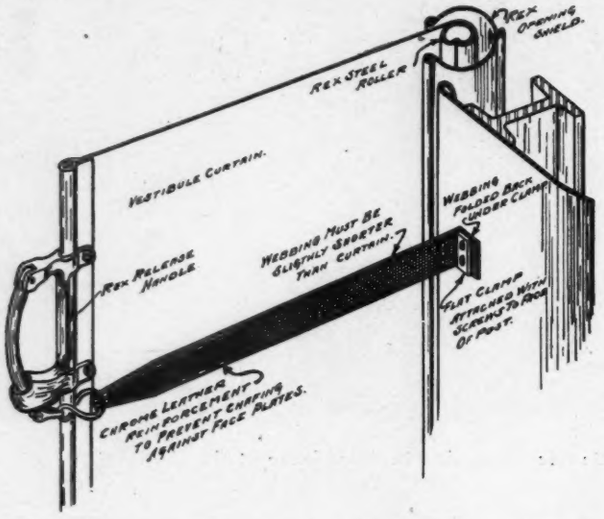
A GROUP OF CHIEF CAR INTERCHANGE INSPECTORS

Top Row, Left to Right—M. W. Halbert, W. J. Stoll, T. J. O'Donnell, B. M. Waldo.

Bottom Row—J. W. Hogsett, F. W. Tapnell, H. Boutet, W. R. McMunn.

IMPROVEMENTS TO REX DIAPHRAGM CURTAINS

The Curtain Supply Company, Chicago, is now arranging its vestibule curtains so that the webbing connected to the releasing handle is attached to the face of the post instead of to the roller, as has been formerly customary. This is done for the purpose of reducing the wear of the curtain due to webbing rubbing against it. The manner in which the releasing handle is connected to it is clearly shown in the illustration. The

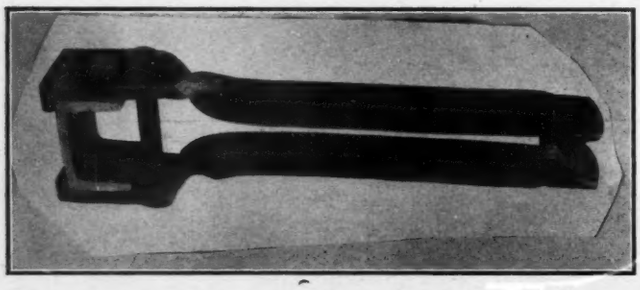


Improved Arrangement for Tripping the Rex Releasing Handle

webbing is reinforced with chrome leather at the end where it rubs against the face plates. It has been found that most satisfactory results are obtained with this arrangement and that the life of the curtain is lengthened.

SOLID FORGED BRAKE BEAM FULCRUM

The illustration shows a forged brake beam fulcrum of a type which was originally developed by the Damascus Brake Beam Company, Cleveland, Ohio, for application to this company's own beams. This design is applicable to beams of channel



Forged Brake Beam Fulcrum for Channel Section Beams

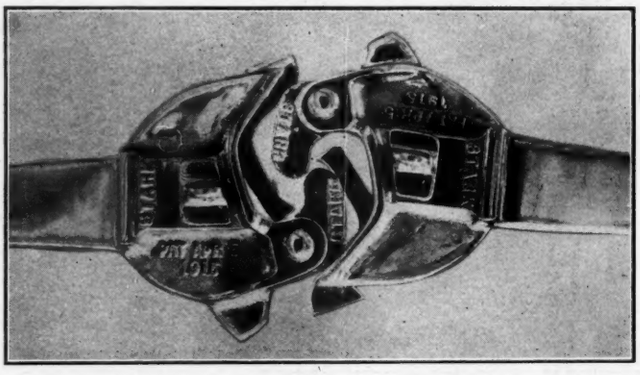
section and is clamped to the beam without the necessity of drilling holes through the latter. It is held in position by a single bolt which clamps the sides of the fulcrum against the outside of the channel. This and other types of solid forged fulcrums are on exhibit at the booth of the Damascus Brake Beam Company.

NEW RAILWAY LINES IN RUSSIA.—In connection with the proposed direct international railway communication, the Russian tariff committee proposes to construct direct lines connecting Archangel with Vologda, Petrograd, Moscow, Kief, Warsaw, Saratof, Kharkof, Odessa, Ekaterinoslav, Omsk, Riga and Reval, and through Archangel connecting with the ports of New York, Halifax, Liverpool and Glasgow.

AUTOMATIC COUPLER WITH MOVABLE GUARD ARM

A coupler designed to be automatic in its action under all conditions is being exhibited by the Stark Car Coupler Corporation, Washington, D. C. Present standard couplers will not couple when both knuckles are closed, and under certain conditions when only one knuckle is open. It is often necessary to run the risk of injury in adjusting the position of the couplers on moving cars to insure that the coupling will "make." The Stark coupler is provided with a movable guard arm which is free to open except when coupled. This provides sufficient opening between the side of the knuckle and the guard arm to permit closed knuckles to pass each other, thus insuring automatic action under all conditions.

The movable guard arm is pivoted against a shoulder in the coupler head. It is provided with a tail piece which conforms to the contour of the head when closed. When open this swings out from the face of the head and on coupling is forced back to the contour line by the knuckle of the adjoining coupler, by which it is held in the closed position.



Couplers with Movable Guard Arms Open

The design of this coupler offers several advantages aside from its automatic action. The most notable of these is the ability to renew all wearing parts. The guard arm is as readily replaced as the knuckle and the life of the head is thus greatly increased.

TURRET LATHE OPERATION.—The Warner & Swasey Co. have been demonstrating some interesting possibilities of the turret lathe at their exhibit. One example was on aeroplane motor cylinders which are being finished in 2½ hours as compared to 37 hours, the former time.

KELLEY COUPLER.—The Kelley Railway Appliance Company, Gradyville, Ga., is exhibiting a coupler which is arranged to permit unlocking when under load. The knuckle tail and the lock block have diagonal surfaces which eliminate the friction which must be overcome in lifting the lock. When locked the knuckle lock is prevented from working up by an additional locking device of small area which swings over the top of the main lock. The knuckle and head are designed to relieve the knuckle pin of strain when the coupler is closed.

FRICTION BUFFER—The Gould Coupler Company, New York, is exhibiting this year a recently developed friction buffer for heavy steel passenger equipment which has a total travel of 5 in. When free the buffer extends beyond the coupling line 2½ in., which is sufficient to insure that the buffers will not separate when the cars are coupled. A further travel of 2½ in. brings into action the friction draft gear which has a capacity ranging from 100,000 lb. to 150,000 lb. as may be desired. The friction elements are contained in a housing, making a complete unit, the principle of construction being the same as in all Gould draft gear. Two release springs are used to insure the release of the friction elements.